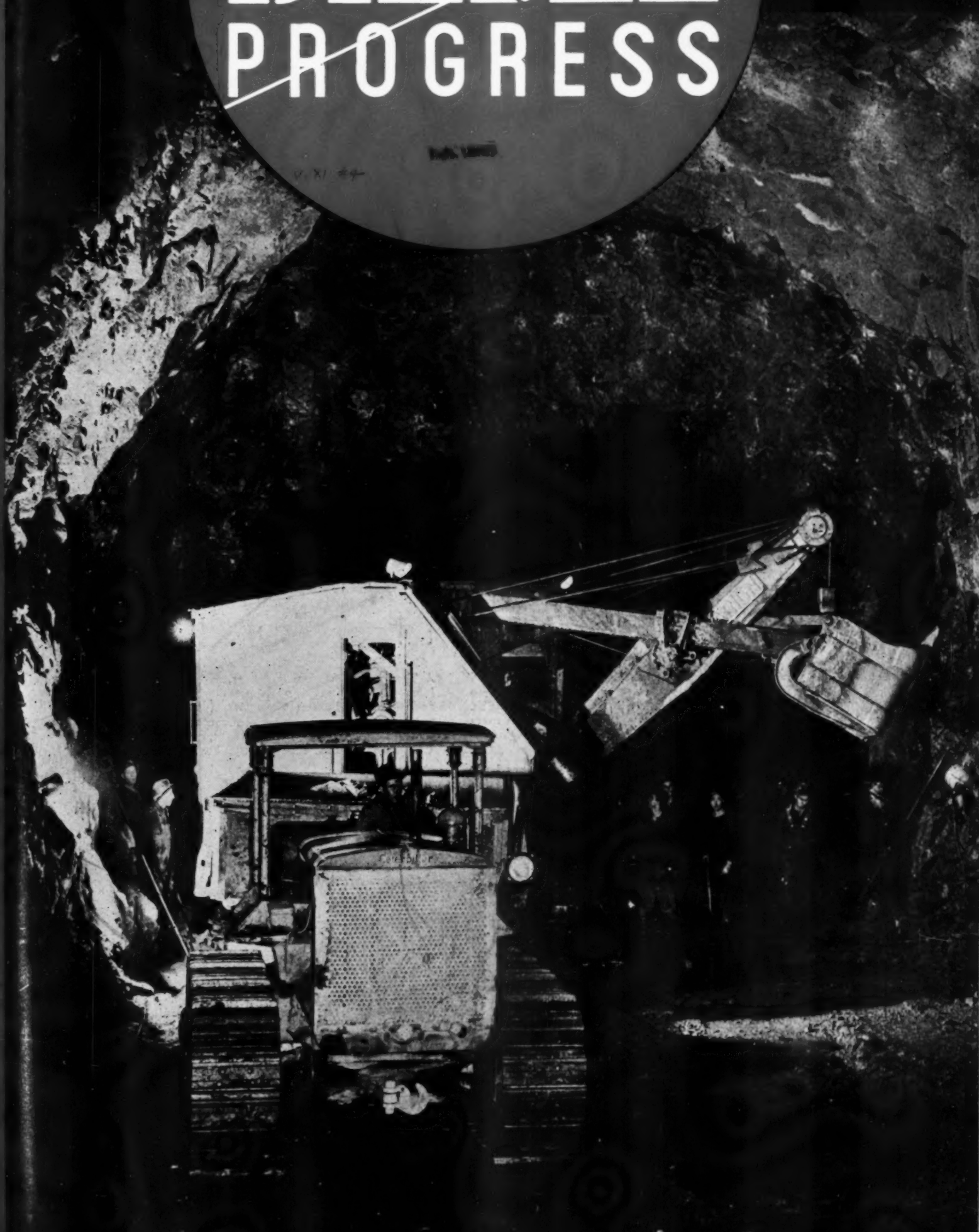


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APRIL, 1945

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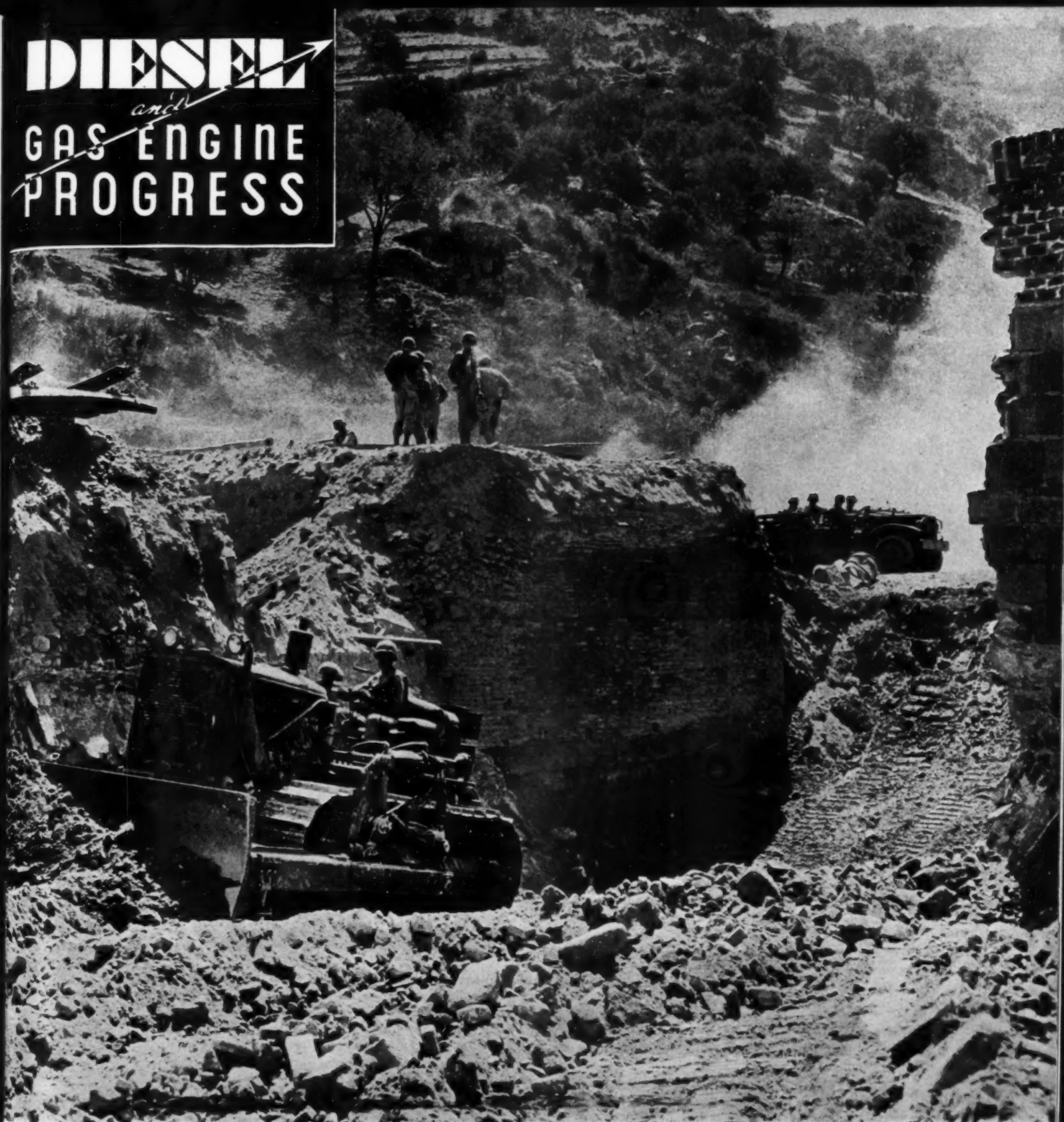
TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT—CBS

DIESEL PROGRESS, for April, 1945. Volume XI, Number 4. DIESEL PROGRESS is published monthly by Diesel Engines, Inc., 2 West Forty-fifth St., New York 19, N. Y. Rex W. Wadman, President. Acceptance under the Act of June 5, 1943, at East Stroudsburg, Pa., authorized March 27, 1940. Subscription rates: \$5.00 per year, single copy, 50c.

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DIESEL *and* GAS ENGINE PROGRESS



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FRONT COVER ILLUSTRATION: Caterpillar Diesel tractor hauling muck away from tunnel heading on the Shipshaw Hydro-Electric Project of the Aluminum Company of Canada, where 1,069,000 yards of rock were moved in 7 months.

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Art Director



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SHELL LUBRICANTS FOR EVERY INDUSTRIAL-USE

GOOD PROVING GROUND FOR DIESEL SWITCHERS

By JOHN E. HUBEL



THAT was probably the reason the Chicago & Northwestern Railway had a 1000 hp. Fairbanks-Morse Diesel-electric locomotive, to be used exclusively for switching purposes, tried out in the yards in the Milwaukee area. With 27 switchyards, miles apart, around a loop, some 30 miles in circumference with its center in Milwaukee, about all of the conditions of grades, inclines, curves and other impediments that are met in any series of switchyards anywhere in the middle west, were found to exist in this area. Milwaukee, situated about 600 feet above sea level, was evidently blessed with wide, deep rivers in prehistoric days. In the now deep, dry valleys of these prehistoric rivers industry has now settled, with some of the largest factories in the country. That means much switching work from the lower levels to those leading to the north, south and west. Switching to the classification yards and to the main lines of the two railroads, to get the freight trains around the residential sections of the city, has, therefore, always been a problem, requiring more than one locomotive to get the freight trains, of 45 cars and less, up the grades. For such switching, 1000 hp. and 660 hp. switching engines have been necessary.

In the Fall of 1944 the Chicago & Northwestern Railroad received from Fairbanks, Morse the first of the new post-war type of Diesel-electric switching locomotives, to be tried out among the various switchyards of the road in the Mil-

waukee area, the hills and dales to be met here being considered a good proving ground for any switching locomotive. As this is being written the Fairbanks, Morse Diesel has been tried out long enough, in pulling or pushing various length of freight trains around the various Northwestern yards to prove its reliability.

Fred Cutter, the foreman of engines in the Northwestern switchyards in the Milwaukee area, has this to say about the Diesel-electric switchers—In the first place, operating costs with a Diesel were found to be about 25% less than those of the steam switcher, repairs running at about 14 cents per mile as against 24 cents for the steam engines. Diesels can be operated 24 hours a day, for an entire month, and then, according to Cutter's experience, be tied up only 10 hours for inspection and adjustment. On the other hand, he says, steam switchers have to be brought in for inspection and servicing every 16 hours, and held for that purpose for 2 hours.

Another point in favor of the Diesel-electric switchers according to foreman Cutter, is that its wheel arrangement enables it to negotiate shorter curves, especially on sidings, where space for curves is often limited, while with the steam locomotive only curves of a certain arc can be taken, the steamers having a rigid arc. With the Diesels, Cutter claims, you can use any locomotive that is available to do the job,

without worrying about intricate siding curves. As for the employees who have to do with the operation of the Diesels, while they did not take so kindly to this type of locomotion when first introduced to the Northwestern yards, after they became used to their easier operation, their cleanliness, inside and out, and the reduction of noise, they became fast friends with their new "iron horses." Now most of the Diesel operators would not want to go back to the steam switchers.

The new Fairbanks Morse Diesel-electric switcher, the first of this make delivered for service in the C. & N.W. Milwaukee area (but which, it is said, will be transferred to other switchyards, perhaps some distance from Milwaukee) is of 1000 hp. 120 ton capacity, powered with a Fairbanks Morse two-stroke cycle opposed piston Diesel. The electrical equipment in this locomotive consists of a single bearing Westinghouse Electric traction generator, connected to the Diesel engine by means of a flexible coupling, separately excited from an exciter generator mounted on the generator and driven by V-belt from the shaft extension. The traction motors—four Westinghouse series wound—are of the axle-hung type with forced ventilation and single reduction gearing. The Nos. 1 and 3 traction motors and the Nos. 2 and 4 are permanently connected, such connection providing effective weight transfer compensation and maximum tractive effort.

BURLINGTON ROUTE

DIESELIZES

ITS CHICAGO-DENVER FREIGHT SERVICE

By CHARLES F. A. MANN

PARAPHRASING Gracie Fields, one might well say, "There'll Always Be A Burlington"! There always has been a Burlington—for the past 95 years, which covers most of the years in America that the railroad industry has been in existence. What began as the Aurora Branch Railroad, connecting up with the then infant city of Chicago back in 1850, has grown by ordered stages into an 11,000 mile system serving 13 western states. Most of its growth took place in the first 60 years of its long history. Since the famous acquisition of the Colorado & Southern's 1800 mile system extending from the Gulf to Wyoming, the Burlington's development has been intensive rather than extensive.

Two major factors govern the Burlington's economic and financial history, happily both favorable to a tremendous degree. First, is the fact that this great system is owned and controlled by the Great Northern and Northern Pacific, the three forming a 26,000 mile railroad empire rated as the largest privately owned group in the world under what actually amounts to a single

Burlington's mile-long freights will have radio. Here, Ralph Budd, president checks a call from the caboose while Edward Flynn, vice president, left, and Mr. Fritts, Electro-Motive test engineer, look on.



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APRIL 194



One of Burlington's 5400 hp. General Motors Diesel locomotives with a train of tankers coming through Sheep Canyon, Wyoming.

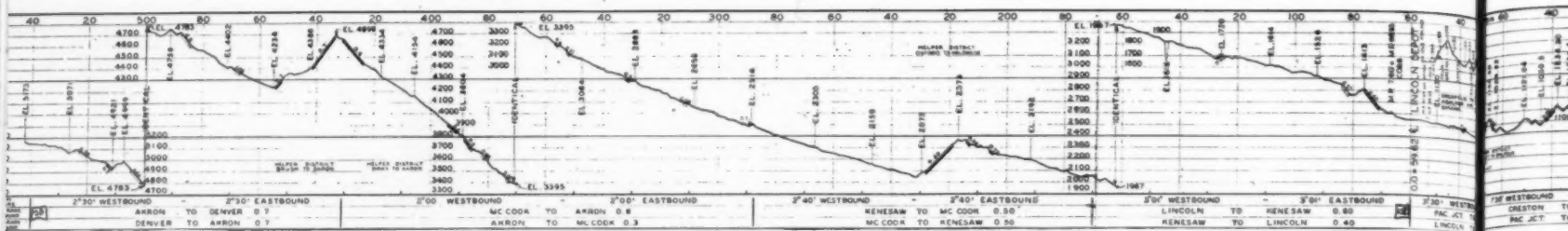
ownership, the parent NP-GN combination being, to all practical purposes, owned by the same controlling group. The second factor is the Burlington's 1000 mile main line from Chicago to Denver is the longest and most important link in a 3-system direct, *competitive* transcontinental railroad route between Chicago and San Francisco Bay.

The Burlington's unique strategic location, with the NP-GN combination feeding two-way traffic

at Billings and St. Paul; the Rio Grande feeding two way traffic at Denver, and a total of 22 main traffic gateways and over 200 interchange points, doing likewise, makes of the Burlington a whole series of "bridge" railroad routes. Traffic on this great system never drops too low nor rises, percentagewise, too far above that lovely railroad traffic "norm" that reacts year in and year out on net railway operating income, and makes its owners and creditors joyful or gloomy. It is one of the most stable

railroad properties in the world because of all these traffic factors.

So is its fleet of over 1,000 steam and Diesel locomotives. Nature was kind to the Burlington, for most of its major trackage has grades even less steep or numerous than most of the Eastern systems and less than half as stiff as the Far West systems. And 95 years of "know-how" mechanically, on the Burlington, has given it a splendid mechanical and operating



staff, renowned for both its conservatism and ability to squeeze the last hour of life from its rolling stock, yet gently and constantly dissatisfied and willing to dare try everything new in the field—a unique characteristic of the Burlington that grew up with its pioneer spirit and became a by-word as far back as the Civil War and all through the years when it sold millions of acres of its land grants to folks in England and the rest of Europe. We cite the 100,000 families "colonized" by the Burlington, as one extreme—and the pioneering done with the Diesel locomotive and the streamlined Zephyrs, as examples of the other extreme. Colonizing a continent and research into Diesels, airbrake application, radio, CTC, Diesel transcontinental buses (the first in USA), streamlined station facilities and a host of other innovations are all part and parcel of this strange combination of ultra-conservatism and modernism, all under one corporate umbrella!

The railroad industry owes much to the Burlington for its intelligent pioneering with the Diesel Zephyr fleet, which it began in 1934. Not overlooked has been the equally intelligent handling of its big fleet of steam locomotives, all inextricably tied in with the fact that the Burlington is a big coal carrier and it has around 800 coal fired steam locomotives and a sizeable fleet of oil burning steamers. Like one of its parents, the Great Northern, the Burlington's motive power department has proceeded calmly with efficient progressive handling of all three—coal, oil and Diesel motive power, to the end that the best of the three will find its proper niche in the operating of this great railroad.

In 1944, conditions on the heavily used Chicago Denver line made it feasible to start using Diesels on its fast, expedited merchandise freight service between Chicago and Denver. A wartime demand for more power on the Denver-Billings line last year gave rise to a temporary "triangle run" of various units of its new fleet of sixteen 5400 hp. Diesel freight locomotives. A sudden heavy movement of oil trains gave rise to the rather startling business of operating the freight Diesels from Chicago to Denver, then up to Billings; back to Denver and then to Chicago, the 3400 mile "Cycle" consuming

about 148 hours, without stopping the Diesel engines once, except in emergencies!

As of January 1, 1944, the Burlington Diesel fleet comprised one 5400 hp. freight; 13 road passenger locomotives and 67 Diesel switchers. The Chicago-Denver freight Diesel operation is the central point of our study, particularly because it is one of the two "main lines" of the whole system. The other "main line" is between Chicago and the Twin Cities, that remarkable piece of low-curvature, water grade, double track, that provides the NP and GN with entrance to Chicago from St. Paul, is a busy site of Diesel passenger operation, and possibly later Diesel freight operation. The Denver-Texas line, practically a trunk line all by itself, connecting the Gulf, Colorado and Pacific Northwest on a strategic fast route, is not now slated for Diesel freight operation, but already well started toward Diesel passenger operation with Zephyrs.

Keeping the perspective of a through transcontinental route, the Chicago Denver line is interesting because half its length, from Chicago to Lincoln, it is one of the nation's No. 1 Granger lines—polite term for farm or corn belt lines. Here it pierces the heart of the world's greatest grain, and livestock sections, so its whole economy must be planned accordingly, right down to mail and express service everywhere. Overriding this are the through coast movements, normally merchandise, but in war a full war load of everything—all to be kept moving on the same set of tracks. Beyond Lincoln, the agricultural phase gradually flattens out, and between Oxford and Denver, the Burlington is a fast, mainline "Western" road, with few branches, no large towns and where the main business is moving things and people fast and in quantities. Eastbound from Denver, the products of Pacific Coast agriculture, imports and western metals and ores, make up full trains, plus heavy movements of forest products.

This all creates an ideal setup for long, heavy freight trains in both directions, that can move unbroken across most of the 1,000 mile run. Diesel fits in well here, for under steam operation 2800 to 3500 tons was a large freight train,

with many water, fuel and locomotive change stops. Now a 100-125 car "CD" freight train rolls in 48 hours from Chicago to Denver—from low-altitude Chicago to mile high Denver, on regular schedule, with no engine changes whatever. Despite the legend of "flat" country operation, every one of the sixteen 5400 General Motors Diesels has regenerative braking for use on the rolling hills with their .4, .6 and .7% grades—light hills for far-West trains but heavy hills for 125 car freights. The use of dynamic braking on the Diesels has been reduced to a fine art by the Operating Department of the Burlington. Probably more extensive use of the dynamic brake on comparatively light grades is made by the Burlington than any other railroad.

The fleet of sixteen 5400 hp. General Motors Diesels now operates mainly in the Chicago-Denver service. Several other important fast freight routes are operated at times with these locomotives. Last Fall, due to war conditions, the Chicago-Denver-Billings and return run of these engines again made Diesel history. Leaving Chicago with fast merchandise freights, they ran out to Denver in 40 to 48 hours terminal to terminal time, via the 1008 mile route through Louisville, Nebraska (26 miles shorter than via Omaha); then 655 miles from Denver to Laurel, Mont., in about 40-48 hours, through the rugged Wyoming country; then repeated the whole cycle in reverse, doing 3400 miles in a week. As traffic returned to normal, the fleet went back to work on the Chicago-Denver run.

While keeping the perspective of coal in railroad economics, it must be remembered that oil is a rising factor of the economics of the whole mountain region—straight down through Wyoming, Colorado, and Texas. Again, part of the economics of postwar high speed passenger train operation calls for a 44 hour daily streamlined Exposition Flyer from San Francisco to Chicago. The Western Pacific and Rio Grande have already planned their end of the fast train—fastest ever offered over this route—to be run with Diesel. The Rio Grande by the time this story is printed, may already be operating the present Exposition Flyer over its portion of the 3-System Coast route, with 3 big 5400 hp. GMC freight Diesels equipped with

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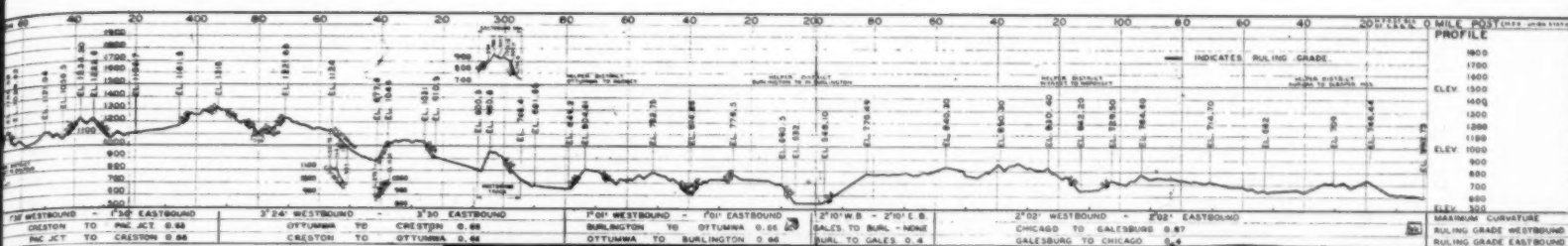
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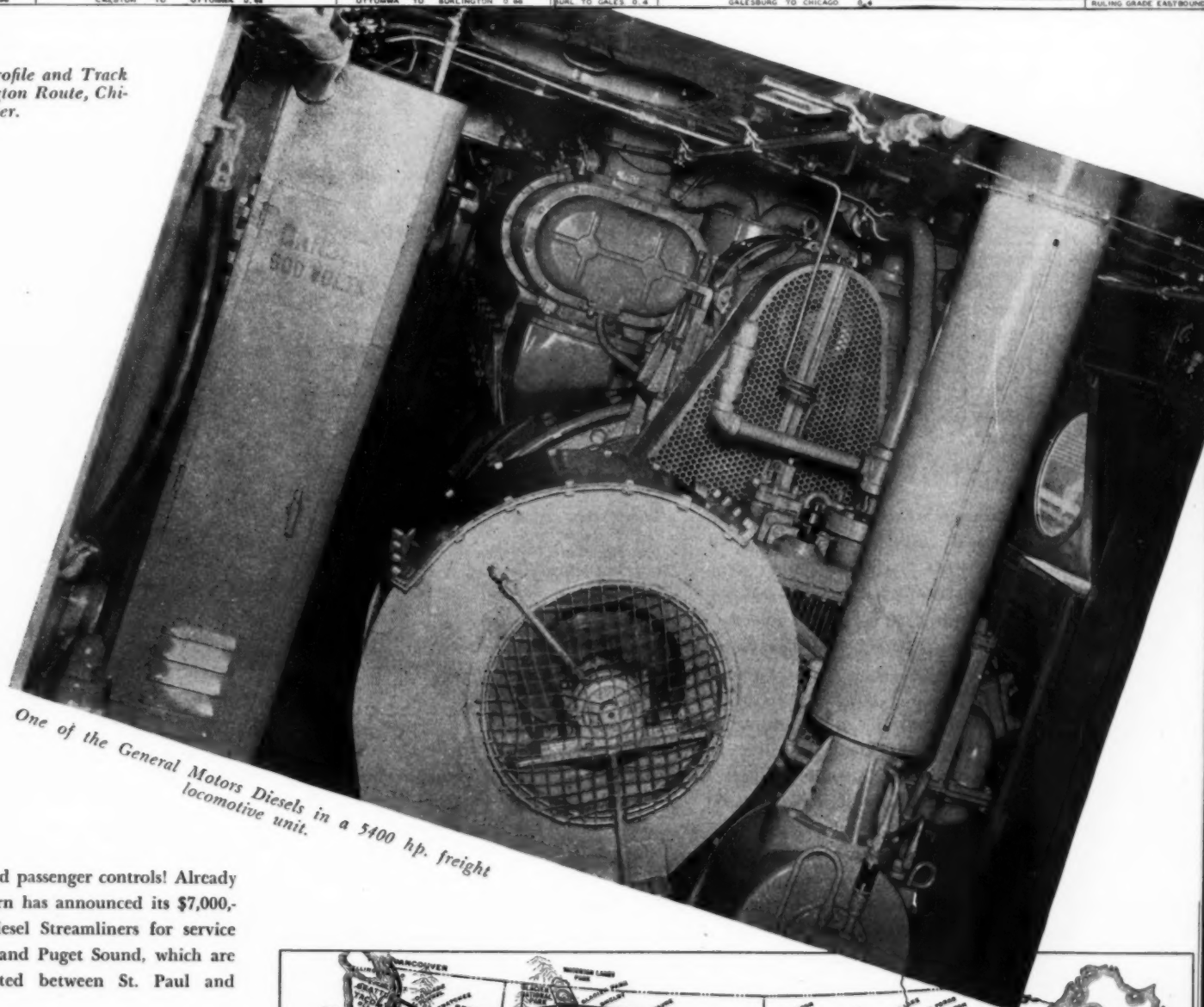
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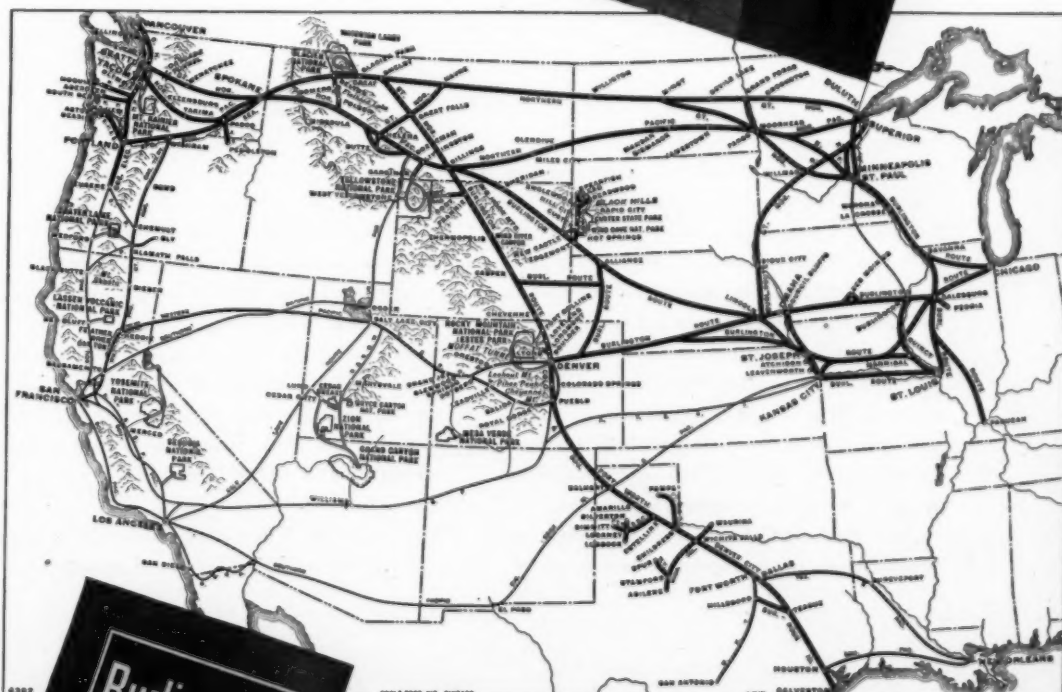


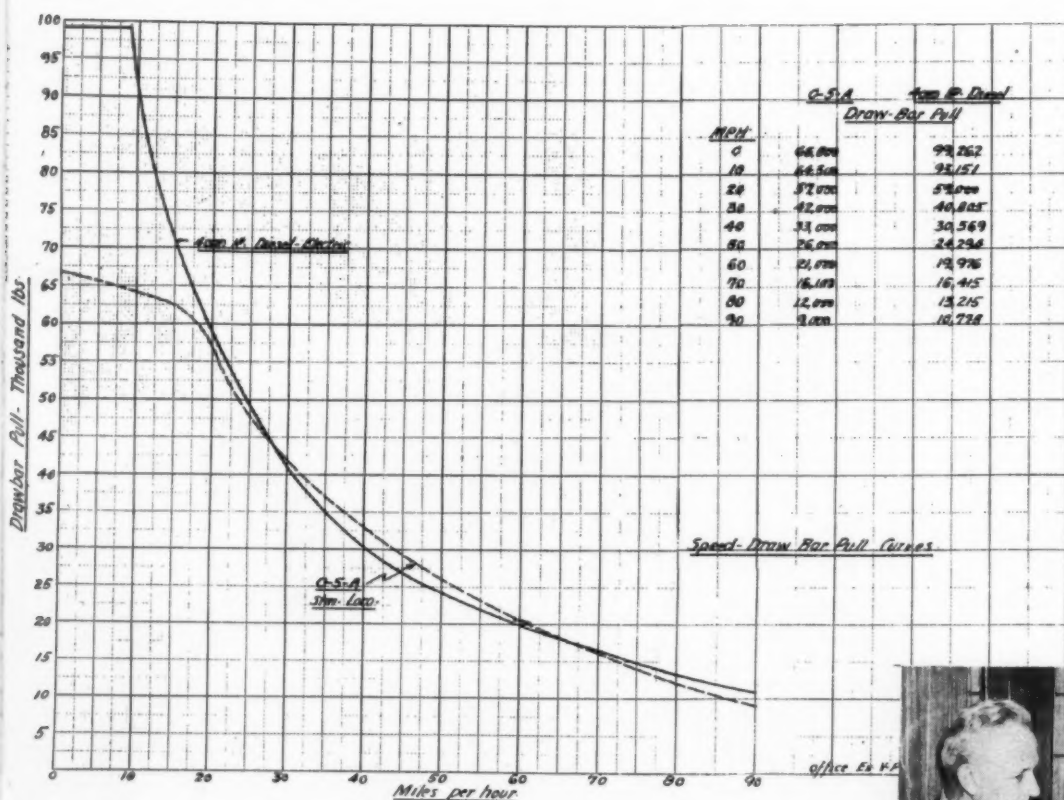
Condensed Profile and Track Chart Burlington Route, Chicago to Denver.



heating boilers and passenger controls! Already the Great Northern has announced its \$7,000,000 fleet of 5 Diesel Streamliners for service between Chicago and Puget Sound, which are Burlington operated between St. Paul and Chicago.

A great many factors are involved in planning ahead for motive power in the postwar era of competition, lighter traffic and demand for speed. With the practice among all railroads to either go in for the heaviest freight Diesels, Diesel road switchers and the 4,000 hp. passenger Diesels, and almost universally for the past 4 years for the very heaviest steam locomotives, the postwar era will find all railroads, including the Burlington, faced with the necessity of stepping down its light weight steam power or outright retirement of 30-40 year old steamers with small boilers, no superheaters or feed-water heaters, and wherever possible substitute the newer Diesels and steamers. Some 120 older





Burlington steamers are scheduled to be stepped down or scrapped. In 1944, according to figures made public by the Burlington, orders were placed for 22 Baldwin-Westinghouse 1,000 hp. Diesel switchers; ten 1350 hp. freight units and twenty 2,000 hp. General Motors passenger units.

Expanding Diesel operations of the Burlington required, in 1944, the addition of facilities at four points on the system. According to figures made public, the Burlington started a \$259,550 expansion program at its 14th St. (Chicago) yard for servicing the Zephyr fleet; a \$462,978 program at Clyde (Chicago) shops for its freight and switcher fleet; a \$454,152 program at West Burlington, Iowa, at its general shops, and a \$521,004 expansion program at Denver terminal to handle all Diesel units operating out of that important city.

Denver is rapidly becoming one of America's 3 key Diesel railroad terminal cities, ranking close to Chicago and Washington, D. C. The Burlington's long Texas line, with its Zephyrs; its line to Billings, Montana, and its connections east and west on the Burlington-Rio Grande midcontinent transcontinental route. Burlington's expanded facilities for nursing its Diesel fleet add one more important chapter. Meanwhile, at Denver, you get from many quarters glimpses of the future of liquid fuel. Colorado possesses, with eastern Utah, huge quantities of coal. So does Wyoming, right along with its oil. Also, in Colorado are 26 billion tons of shale good for production of petroleum-type

Comparison chart of O-5-A steam and 4000 hp. Diesel-electric locomotive speed-drawbar values.



Vice President Murphy hands Dr. George P. Thompson of Aurora, Illinois, a gold watch expressing Burlington's thanks for the Doctor's report of a broken rail. Dr. C. B. Thompson, left and J. C. James, Burlington V. P. and general counsel, right.

Diesel fuel oil at a cost of not more than \$1 per barrel. Then, the coal people keep talking about a new liquid Diesel fuel to be made out of bituminous coal by simple hydrogenation. So—betting either way, fuel for Diesels will always be plentiful around Denver, hence its growing importance as a Diesel railroad center of the nation... Biggest in the west to date. Counting 48 hours from Chicago to Denver on the Burlington; 36 hours from Denver to Salt Lake on the Rio Grande and 48 hours from Salt Lake City to Sacramento, plus another 12 hours to San Francisco, including terminal delays, you already have in operation a Diesel freight service on a 6 day basis from Chicago to the Coast, ready for postwar publicity. Now, however, wartime congestion stretches this out to a safe 8-day schedule that can be met right on the nose. Postwar enthusiasts vision a 5 day freight service with Diesels. In World War I, remember, this was 10-12 days!

Your correspondent started out to ride a crack Chicago-Denver freight all the way across, but

wound up by transferring way out at McCook, in Western Nebraska, 750 miles from Chicago, to the famed Denver Zephyr for the last lap into Denver. The 750 mile ride on two of the heaviest Diesel freight operations in the world, proved an eye-opener—an eye-opener for not only railroaders, but shippers interested in speed; the public interested in quiet, fast operation and the railroad industry in its constant search for answers about lower costs, more speed and competitive advantages in moving not a carload of freight, but land cargoes by rail.

Clyde Shops, near the Chicago yards, lie at almost exactly 600 ft. above sea level. 200 miles west of Clyde, where the Burlington crosses

the Mississippi River at Burlington, Iowa, you drop down to 532 ft. above sea level. 275 miles further west at Pacific Junction, where you cross the Missouri River, the Burlington is a mere 957 ft. above sea level. A light 7/10 of 1 per cent ruling grade—light for mountain-climbing railroads, heavy for "flat country" railroads, up and down through Iowa and Illinois puts you at the "foot" of the Burlington's big hill. From the Missouri River to Denver a climb of just over 4,200 ft. is made in 525 miles, on a single track main line that is a marvel of low curvature and perfect alignment. We depart from Clyde (Chicago) at 6:10 p.m.—right behind an Aurora commuter train, with 117 cars and 5388 tons; Jimmie Vaughan at the throttle and W. H. Lavelly, fireman. It is 2:25 a.m. before we leave Galesburg yard, with 107 cars and 5317 tons after a dropoff and pickup. Galesburg is the big central operating hub of the entire system with one of the world's largest classification yards and a whole group of service facilities for the entire system. Smoothly we roll straight toward the Mississippi at Burlington, averaging

over 40 mph. for the 43 mile run. Engineer Robert Stewart eases his big train down with the regenerative brake, to about 18 miles per hour, then a stop with air for a head end helper up the short .9% grade of West Burlington Hill, famous for the site of George Westinghouse' first successful experiments with his air brake. From Galesburg to Ottumwa, 117 miles, we do it in 3 hours and 30 minutes flat—fast time of around 35 miles per hour average. Crews change again and we pick up Engineer F. E. Fisher who takes us the next 114 miles to Creston, Iowa in 3 hours and 40 minutes, with another stop for crew change. It will be observed that the time honored 8-12 and 14 hour "run" of a freight train through a division has been chopped nearly 50%—and your freight crews do their day's work in about 4 hours on a crack transcontinental freight! Leaving Creston at 10:08 a.m. we negotiate the next 83 miles to the dreary, windswept flat on the bank of the Missouri River, known as Pacific Junction, where "Lines East" end, and "Lines West" begin. We do this 83 miles in just over 2 hours, despite the .7% grades in short spots. After letting off Engineer W. N. Ralls and stopping for lunch, CD 14 becomes Extra 67 West, Pacific Junction to Lincoln, via the freight route through Plattsmouth, Oraopolis, Louisville and Ashland—the one passengers never see because most of them go via Council Bluffs and Omaha, lying to the North. The same Diesel No. 110 pulls the big train, but we've taken on 17 cars and now have 6344 tons and 125 cars, with R. P. Smith as engineer. Smitty turns out to be one of the

Burlington's best, and though held down to a crawl for the 62 mile run—they're rebuilding, reballasting and realigning every mile of this back-woods cutoff freight line—Smitty finally opens her up out of Ashland and we reach nearly 50 miles speed as we race into Lincoln, arriving around 5:30 p.m.—4 hours to do a mere 62 miles! When the track is fixed, this section will be good for 40 miles speed—but not now. After a snooze uptown, we finally depart on No. 67—a day later, having watched the busy Burlington's fleet of freights and passengers roll by from several vantage points. CD 15 is the number—they raise the CD one notch each day of the month until it becomes 30 or 31—so they can keep track of things as it progresses westward. It takes about 2 hours to clear Lincoln freight yards, but after we leave Cobb Junction about 7 p.m., it is a long, even roll west ever climbing and the 225 miles from Lincoln to McCook are negotiated in about 8 hours actual running time, with crew changes at Hastings. West of Hastings, the vintage of the automatic block and general character of the line, particularly past Oxford where the branches fade out, the whole territory is being planned for CTC operation, with long sidings and fast turnouts, so the whole railroad can be operated by boards at Akron and McCook and everything on the line kept moving automatically.

Advent of the highpowered Diesel freight and passenger locomotives, plus vastly improved technique at building roadbed and trackage for them to ride on; plus the miraculous dexterity

of handling trains—fast Zephyrs or mile long freights—with CTC removes forever the former handicap western roads had with their great mileage of single track mainlines. The railroad of tomorrow is actually here, in a small way, today—the Burlington's shrewd planning and sound wartime engineering has laid the foundation for postwar operating efficiency such as the industry has never seen before.

The old "drag freight"—the breadwinner of humble speed and endless length, now steps out as the symbol freight at passenger speeds. CTC and Diesel locomotives have wrought this change. Not to forget the economic advantages of being able to increase the round trip, revenue miles of each freight car, in a year's time, by speeding up the usage of the same quantity of rolling stock.

The fleet of sixteen 5400 hp. General Motors Diesels apparently behaved uniformly well in the first 11 months of their activity on the Burlington.

Cumulative records show a remarkable uniformity in behavior as to average monthly mileage run; average train speed; average tonnage hauled and average availability. For example, November, 1944's record showed high principal mileage was made by No. 100—oldest in the fleet, which started service in January 1944. No. 100 made 11,550 miles. Lowest was run off by No. 105, with 8,018 miles. But all the rest kept close to 10,500 to 11,000 miles straight across the board.

Burlington 5400 hp. Diesel locomotive No. 100 in Galesburg, Illinois yard with "Hollywood" lighting effect.



FROM THE BURLINGTON RECORD:

1. Availability:

In spite of the high average daily load (4700 to 5800 tons per freight train), the lowest of the fleet of 16 averaged out at 82.5% for No. 105 and up to 89.6% for No. 114.

2. Average Mileage: Per Month:

IN EXCESS of 11,300 miles FOR ALL SIXTEEN.
A record among U. S. Railroads.

3. Cost Per Mile for Maintenance:

\$0.185 for No. 105 was the highest. \$0.097 for No. 115 newest of the fleet, so naturally would not reflect much maintenance after only 30,529 miles.

4. Cost of Operation & Maintenance Per Mile:

(Fuel, wages, lubricants, repairs and supplies)

Here again this type of Diesel freighter shows a uniformity in costs per mile that is almost remarkable. Number 113 with 43,850 cumulative miles, turned up \$0.615 per mile, lowest while No. 114 showed the highest cost at \$0.646 per mile with 32,087 cumulative miles. No. 100 with 133,852 miles rolled up as the No. 1 in the fleet, EQUALLED EXACTLY No. 113's record. All the rest stuck within 1¼ cents per mile of hitting the high or low cost performance!

DEPRECIATION:

The Burlington now keeps its 5400 hp. Diesels on a 5 year write-off schedule, which is charged back on a per mile basis, running from about 51 to 70 cents per mile, under permissive ruling by the ICC on wartime equipment purchases of locomotives and rolling stock. By 1950 the whole \$8,300,000 fleet will be paid for.

Likewise the fleet of 16, in November, produced a train miles per hour speed record varying from 23.7 for No. 102 to 27.8 for No. 106—but all keeping close to the 25-26 mile per hour average speed. This means 40-50 mph. whenever possible. This is interesting when further down it is noted that the average train these engines handled at that average speed is also high—running from 4278 tons for No. 113 up to 4645 tons for No. 112. Thus the remarkably high average speed on the line—at full utilization—plus the remarkably high average tonnage hauled—both high for any type of locomotive—steam or Diesel—the Burlington's able operating department is obviously qualified to get returns on their huge Diesel investment and do good railroading as well. For the layman, this simply means the Burlington loads up their 5400's to capacity of the track, switches and drawbar pull required to maintain schedule, day after day, throughout the two long mainline runs, and the Diesels deliver the goods.

Locomotive No. 101 has rolled up the astounding total of 611,805,000 ton miles in just 11 months—and at an average (cumulative for 11 months) speed of 27.8 miles per hour for every hour that old Diesel pulled a train over the road! Twenty years ago a good steam loco-

motive took five years to do this same job! Who says the New Day hasn't dawned on cargo-mass-transit of goods by rail, over land, as a steamship does across oceans?

"Principal miles" refers to the total miles run doing actual work of hauling a train. "Other" miles refer to light engine mileage.

In the first 11 months of 1944, the fleet of sixteen Burlington 5400 hp. Diesels rolled up 1,149,744 "principal" miles and 14,976 of "other" miles. This again is remarkable when you realize that No. 100—the Photogenic Number 1 illustrated on these pages, started January 1, 1944, and by June No. 108 had arrived, and it was not till September 1944 that No. 115 had gone to work. Cumulative mileage on all these must be reconciled with this fact. No. 115, for instance, by November 30, had only piled up 30,529 principal miles, while No. 100 and No. 101 had rolled up almost exactly 134,000 miles apiece.

Taken as a group, if all 16 continue their 11,700 miles monthly average in 1945, this means these sixteen Diesels will roll up nearly 2,500,000 miles in 12 months! Shades of the old, almost forgotten, wood burners of 1850, on the Aurora

Branch Railroad!

Availability, cumulative, and average for the entire fleet runs up to 87.4 and down to 82.5 per cent, and hugs so close to a uniform 85% average availability, with over 92% of these available hours actually utilized, as to be a distinct tribute to the Burlington's shrewd operating department and the men who have come over from steam to Diesel abruptly, with little previous training on mainline Diesel.

Nothing is discernible now, to mark the Burlington as anything but one of the big U. S. railroad systems to keep on earning profits and serving the public well far out into the post-war world of air, highway and private auto competition. They've set a pace that will merchandise Burlington service to the public, at a profit. If bungling Government will only let magnificent properties like the C.B. & Q. and its two lusty parents, alone—give them an equal break with their competitors, Joe and Jane Public and J. P. Shipper will give them their patronage forever. Ed. F. Flynn is Executive Vice President; H. G. Murphy Assistant Vice President; H. H. Aurbach, Mechanical Assistant to the Executive Vice President and E. F. Weber, Gen. Supt. of Diesel equipment.



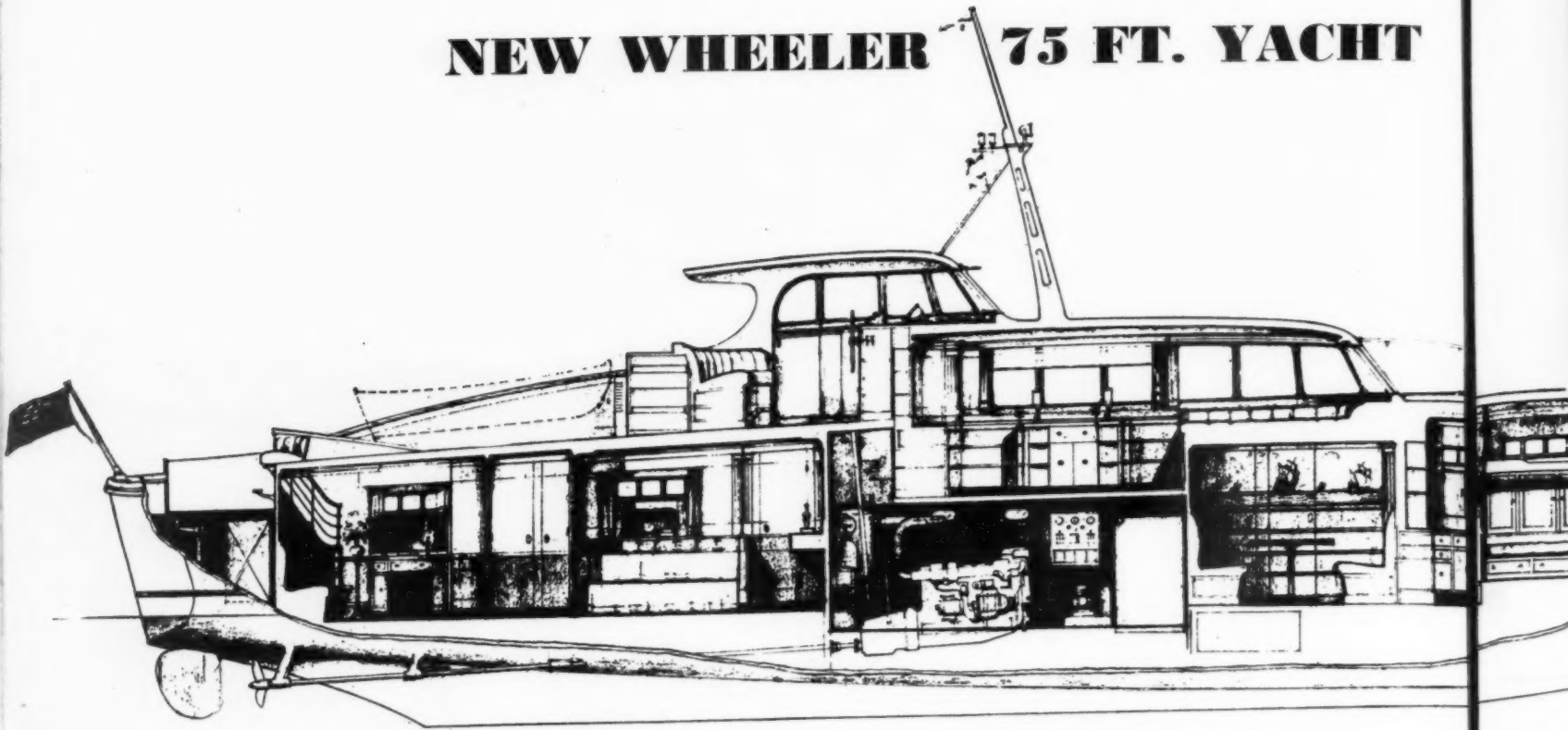
ONE of England's most spectacular and terrifying fires, according to reports—a river of flaming gasoline which threatened to engulf a Southwestern English village, was recently brought under control by an American-made Diesel bulldozer loaned by the U. S. Navy and manned by Navy personnel. A hidden gasoline dump had been hit by an enemy air raider and the wave of fiery fuel splashed across half a mile of countryside, rushing from the storage tank at the rate of 1000 feet per minute in a flaming stream which splashed downhill with the almost certainly doomed village in its path. Seizing the last available moment, the brave operators of the "Dozer" opened the throttle, dug in deep and threw up a dam to stop the on-rushing torrent of flame. Water had to be played on both firemen and bulldozer as well as scorched houses because of the intense heat. The fire burned itself out behind the earth dam and the village was saved. This bulldozer was mounted on an Allis-Chalmers tractor powered with a General Motors Series 71 Diesel as revealed by the on-the-scene photograph reproduced herewith—typical of thousands of prototypes doing yeoman service all over the world. The fight to save this village had been going on for twenty-one hours before the bulldozer arrived on the spot to make a last ditch stand.

"D O Z E R"

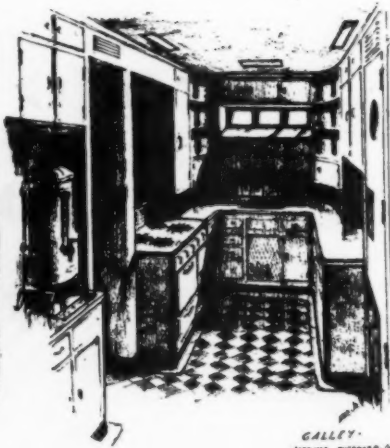
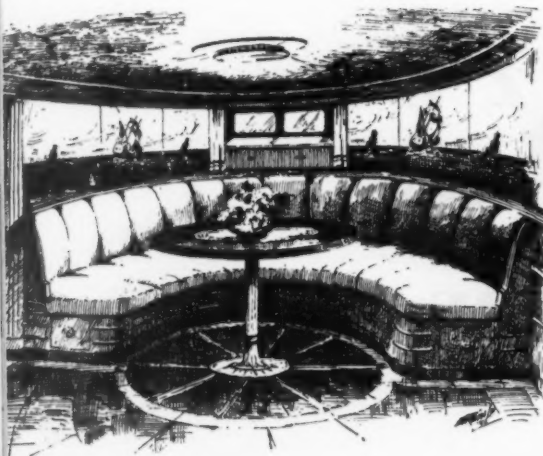
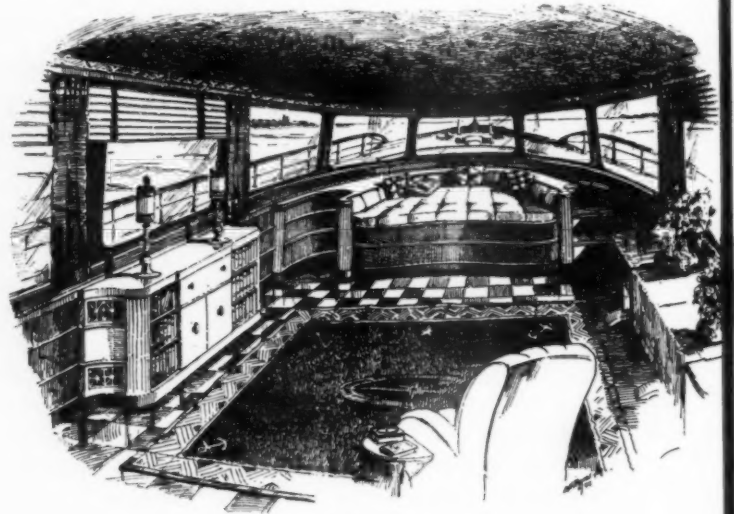
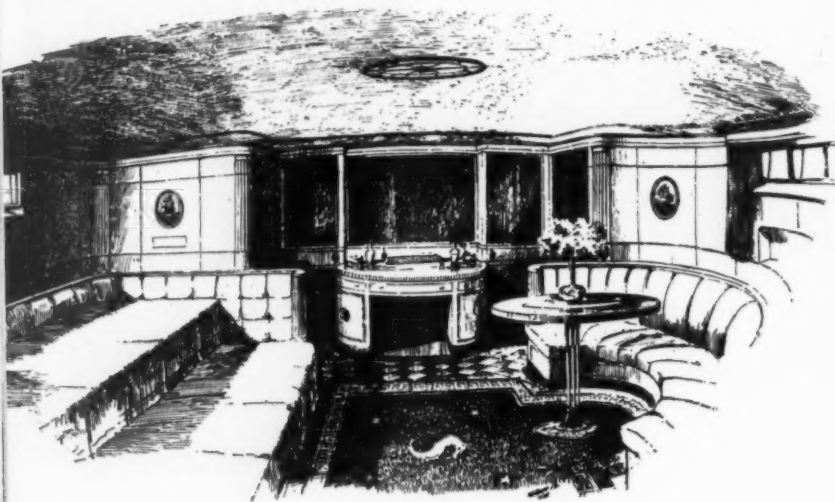
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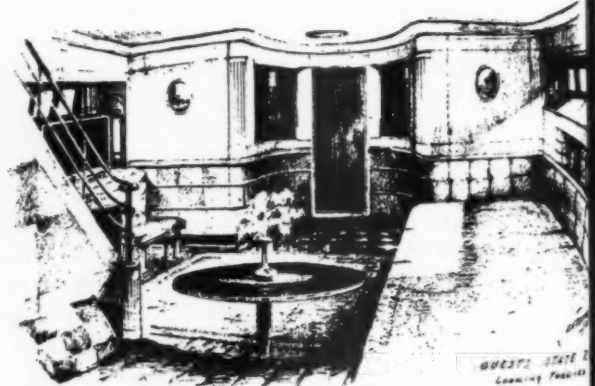
NEW WHEELER 75 FT. YACHT



COCKPIT GUESTS' STATE R.M. OWNER'S STATE ROOM BRIDGE ENGINE ROOM SALON LOUNGE GALLEY CREW'S



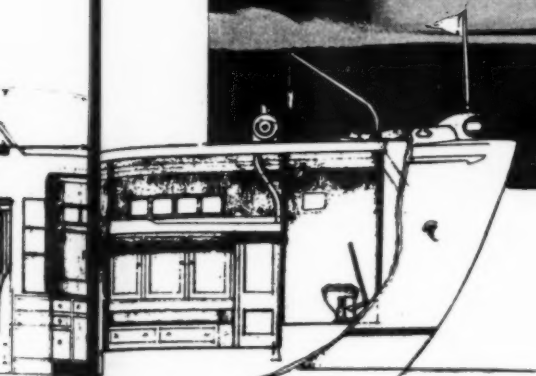
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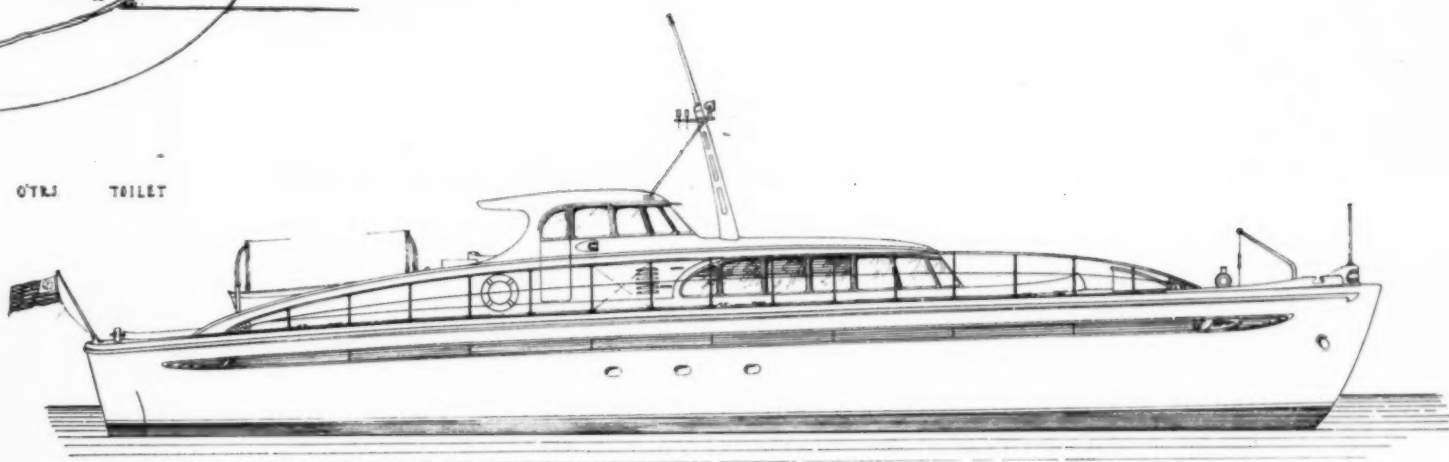
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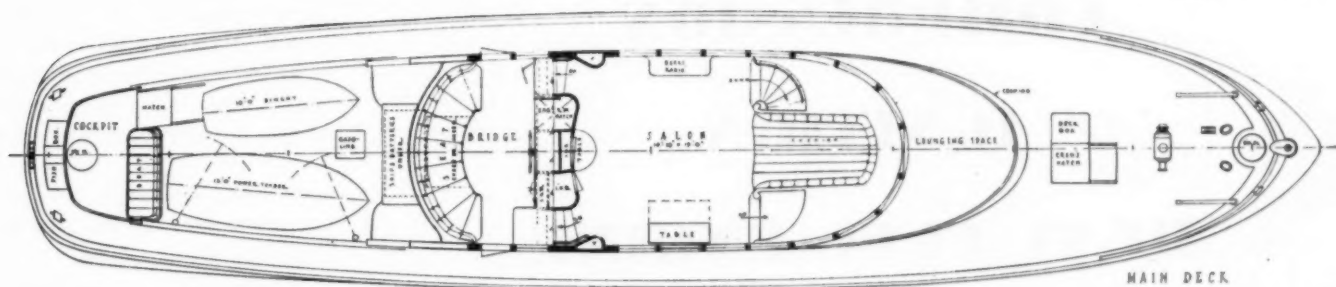
T



CALLING CREW'S QTY'S TOILET



OUTBOARD PROFILE



MAIN DECK

HERE on these two pages we see the shape of things to come in this luxurious post-war beauty designed exclusively for the Wheeler Shipbuilding Corporation by John H. Wells, the designer and builder both contributing from their respective wide experiences in this class of work. With an overall length of 75 ft., beam 16 ft. and draft of 4 ft.-6 in., this yacht, aside from its most pleasing outboard appearance, embodies many dreamed-of features we never expected to see in a vessel of this size. Gone are the old-fashioned square state-rooms. In their place are individual units combining richness in appearance with maximum utility and many little comforts previously found only on much larger boats. The sketches speak for themselves.

For example, picture the salon with an overall length of 19 ft.-6 in., between the after bulkhead and the forward windows, with floor space

of about 11 ft. x 11 ft. and a dining table comfortably seating eight persons. Notice the circular lounge with its round table—an ideal spot for cards or breakfast. The engine room is designed for a pair of Diesels of about 270 hp. each to give an approximate speed of 15 to 16 mph. with fresh water (closed system) cooling, an auxiliary lighting plant, fresh and salt water pressure pumps, starting batteries, switchboard, fire, bilge and service pumps, fuel storage of 760 gallons and fresh water capacity of 550 gallons. The engine controls are brought alongside the steering wheel and there is a hatch leading directly from the bridge to engine room with ample headroom in the engine room for easy access to the machinery. A hot water heating plant is provided which may be used to heat the entire boat in cold weather. Forced ventilation is provided in all quarters and the vessel is insulated throughout against heat and sound.

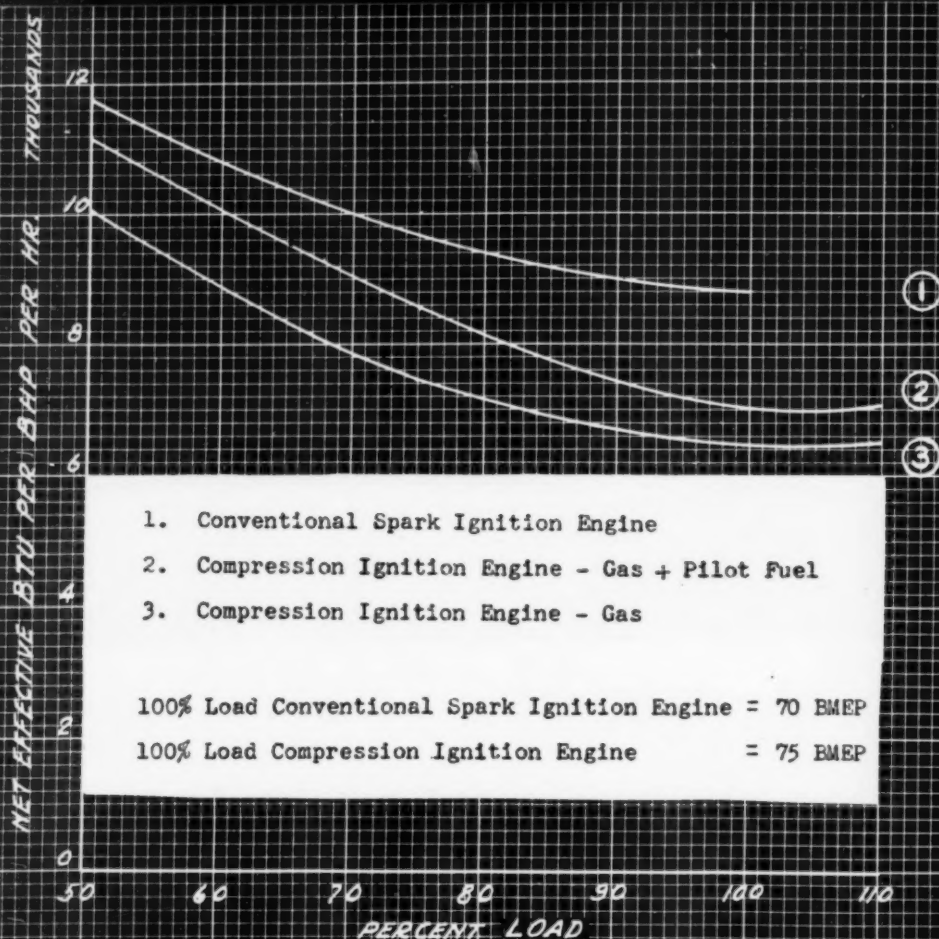
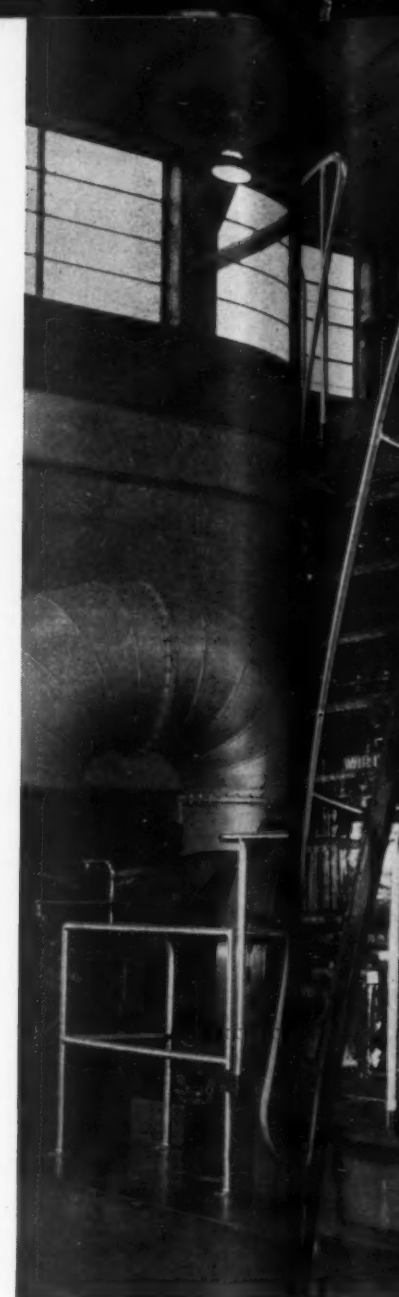


Chart showing the net effective BTU per BHP for three types of engines, as indicated.

Two Worthington, compression-ignition dual-fuel engines are seen in this view of the Tallman's Island, New York, disposal plant. Note the pilot fuel injection pump below the exhaust elbow.



COMPRESSION IGNITION DUAL FUEL ENGINE

LATE in October, 1941, after an exhaustive study of various methods which had been used by others, experimentally and commercially, for utilizing gas fuel for compression-ignition internal combustion engines, Worthington initiated a program for experiment and research with a view to developing a practical dual fuel engine to meet the requirements of American practice.

As a result of work done under this program a dual fuel engine which in all respects seemed to be entirely satisfactory, and in some respects novel, was developed. Its performance indicated fuel economy substantially identical with that of Diesel engines utilizing liquid fuel alone, and its load carrying capacity exceeded that of an engine of the same size operating on

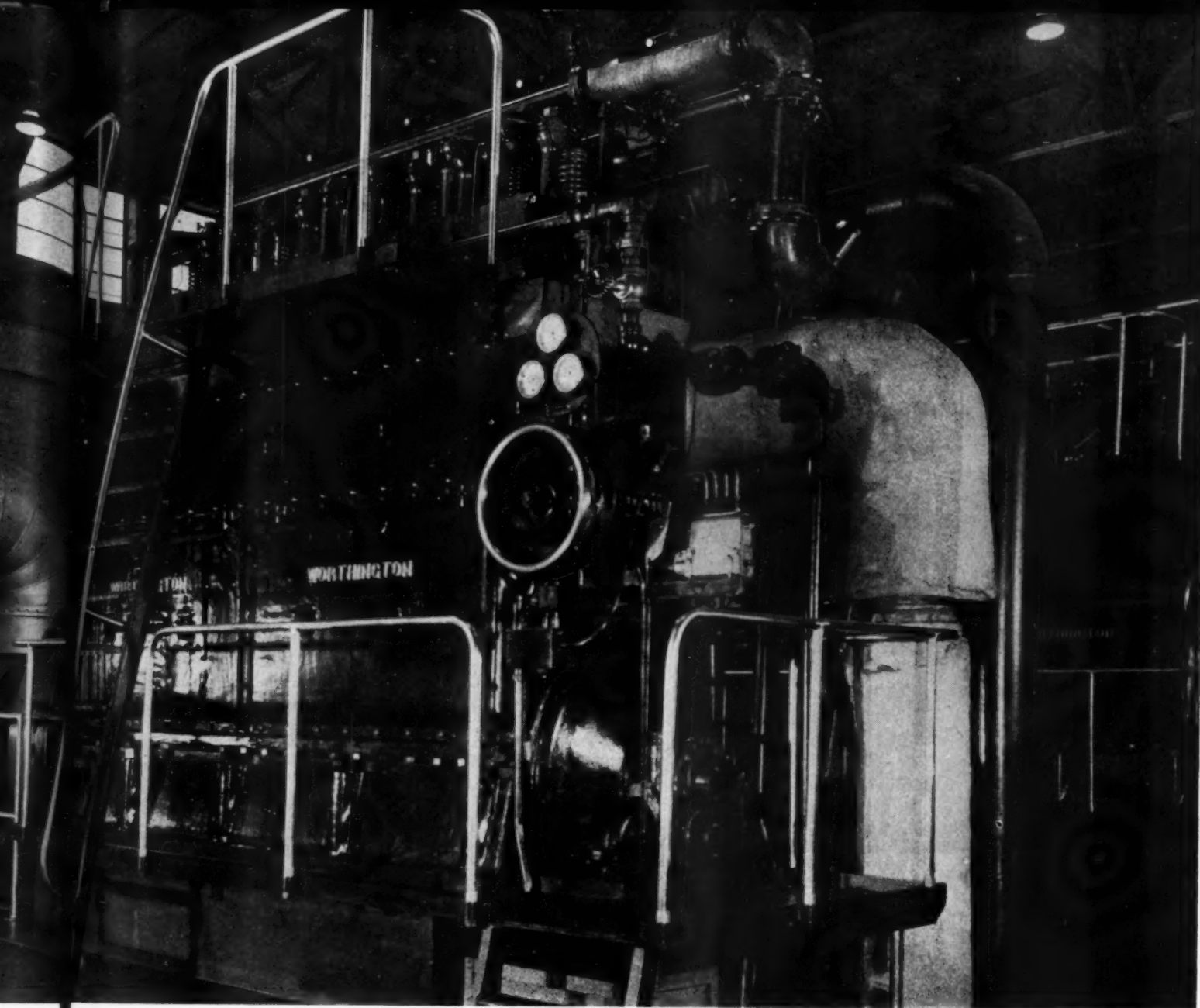
gas in the usual gas engine manner. Early in August, 1944, this dual fuel engine was shown to a representative group of consulting engineers and others and its performance demonstrated. Included in this group were:

S. A. Greeley, Chicago office, Greeley & Hanson; C. H. Becker, Chicago office, Greeley & Hanson; C. R. Velzy, New York office, Greeley & Hanson; J. W. Vandenburg, City of New York, Chief Engineer, Dept. of Sanitation; W. T. Chamberlain, City of New York, Project Engineer, Dept. of Sanitation; H. A. Kemp, City of Washington, D. C., Director of Sanitation; W. H. Sears, City of Boston, Mass., District Commissioner; Alan Drake, City of Buffalo, N. Y., Deputy Water Commissioner; Newall Nussbaumer, City of Buffalo, N. Y., Director of Public Works.

It was operated with gas-oil ratios of 100% oil also 95% gas and 5% oil. It was later ar-

ranged to ratio and long as en in gas su oil suppl

This new an old id plied by the cent patent N cycle "in the worl reach its temperat mixture tion of mixture. dated 19 principl British r



ranged to burn oil alone or both in any desired ratio and to operate mainly as a gas engine, so long as enough gas was available, any deficiency in gas supply being made up by increasing the oil supply to carry the load.

This new Worthington dual fuel engine utilizes an old idea first proposed and successfully applied by Rudolph Diesel before the turn of the century. It is described in his German patent No. 109,186 dated 1898 as working on a cycle "in which the compression temperature of the working mixture of fuel and air does not reach its ignition temperature but the ignition temperature of a second easier ignited fuel or mixture is reached or surpassed so that an injection of the latter starts the combustion of the mixture." Dr. Diesel's U. S. patent No. 673,160 dated 1901 further explains and emphasizes the principle. Some ten or fifteen years ago various British manufacturers utilized this idea in en-

gines which they developed and which have since come into extensive use for operation on producer gas. They have been variously described as Dual Fuel Engines, Alternative Fuel Engines and Gas-cum-Oil Engines. They can: (1) change over from one fuel to the other without any dismantling or shut down, (2) operate equally well on either gas or fuel oil, (3) they are convertible at any load without shut down, (4) are equally efficient on either gas or oil and develop 20% more power than gas engines operating on the "Otto cycle."

The Worthington engine while operating much in the same manner as these British built engines differs from them in many of the mechanical details, including the method of control. The novelty of the Worthington construction lies in the fact that it adapts the compression-ignition principle to an engine using either oil or gas, or both in any available combination

and is controlled by an automatic governor responsive to the relative proportion of the fuel types available as well as to the speed and load requirements.

The performance of the Worthington dual fuel engines operating on city gas having a fuel content of 800 BTU./cu.ft. and with approximately 5% pilot oil for ignition is shown in the accompanying curves.

Shortly after the completion of the experimental engine at Buffalo, a unit of similar size equipped for operation with a gas-air mixture and compression ignition by pilot oil injection was installed at the Talman's Island Sewage Disposal Plant of the City of New York. This unit is now in successful operation on sludge gas, having a heating value of approximately 640 BTU. per cu. ft. This engine is shown in the illustration above.

NEW GAS ENGINE DESIGN

Cuts Fuel Consumption 25 Percent

By RALPH L. BOYER*

Control end of Cooper-Bessemer Diesel engine showing the gas-oil operating mechanism.

A NEW development in the Diesel engine field, which will enable the engine operator to use either gas or oil as fuel without any electrical sparking device, and which will cut fuel consumption of gas engines by from 20 to 25 per cent, has been announced by The Cooper-Bessemer Corporation. This development is the result of experimentation which began in 1927. Recently, efforts have been rewarded by the successful operation of a natural gas engine on the Diesel principle. This enables the unit to operate on a wide variety of fuels including fuel oil, natural gas, manufactured and coke oven gases, sewage gas, and refinery by-products.

The conversion from liquid to gas fuel is as simple as the closing of one valve and the opening of another with the engine operating continuously at full load. Although conversion from one fuel to another has been possible in the past, it has always been necessary to shut down and exchange major or minor parts of the engine.

The Cooper-Bessemer Corporation already has

* Chief Engineer, The Cooper-Bessemer Corp., Mount Vernon, O.

engines embodying the new principle in production along with its standard line of marine and stationary engines and standard compressor units. The development leading up to the burning of gas on the Diesel cycle has been an interesting one and can best be explained by comparing it with the normal spark-ignited engine operating on what is known as the Otto cycle.

The usual 4-cycle gas engine operates on the same general principle as the better known 4-cycle gasoline engine. A mixture of gas and air is made on the intake, the ratio of gas and air being held constant. The quantity of the mixture is varied in accordance with the load demand by throttling the intake. At full load, therefore, the intake manifold is under only a slight vacuum, while at no load it is under a high vacuum. The compression pressure depends upon the load and at full load ranges from about 90 pounds to about 125 pounds per square inch, depending upon the quality of gas. Ignition is always by means of spark. Two-cycle gaseous-fuel engines operate on the same principle, except that inasmuch as the cylinder is scavenged with air the gas is not put into

the cylinder until after the ports are closed. Therefore, on the 2-cycle engine the air quantity is constant, while the gas is varied, producing a mixture which is not of constant quality as is evidenced by the fact that the 2-cycle engine usually misses a great deal on the lighter loads.

The thermal efficiency of an internal combustion engine is a function of its compression pressure. For example, a 125-pound compression engine usually results in about 10,000 Btu's per brake horsepower hour, while a 400-pound compression engine usually produces a brake horsepower hour for about 7,500 Btu's. It is, therefore, always desirable to keep the compression as high as possible.

On the Otto cycle engine, the compression is limited because of premature ignition and must be held to the point where there is no danger of the mixture being ignited before the proper time. Therefore, the Otto cycle is limited to about 10,000 Btu's per brake horsepower hour, or an efficiency of about 25 per cent.

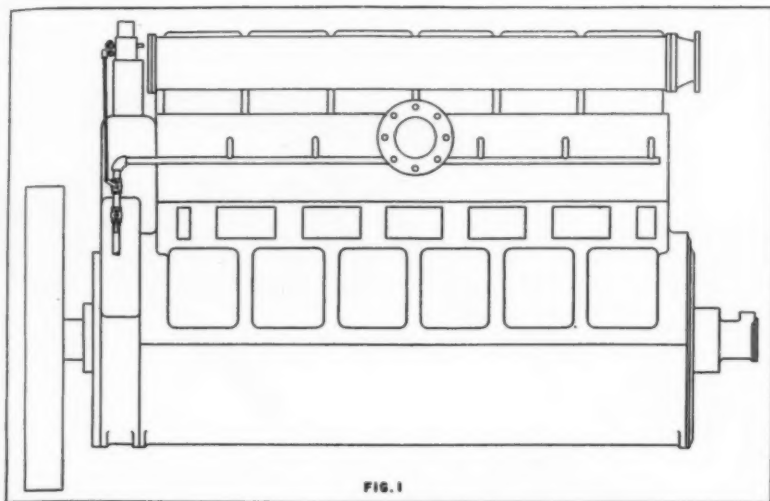
In 1927, we had the idea of burning gas on the Diesel cycle. A single-cylinder test engine was built and operated on this cycle in 1928. Since it was not possible to go much beyond 125 pounds compression with the regular line of gas engines, it was assumed that there was no chance of compressing the mixture to 400 pounds for the Diesel cycle. It was arranged, therefore, to compress air only and then inject the gas on top dead center under very high pressure. The gas pressure actually used was about 1,000 pounds per square inch. It was found that while it was possible to run such an engine without any other ignition means, the engine performed very much better if pilot oil

injection engine a record. high-pressure, top injection would n the time

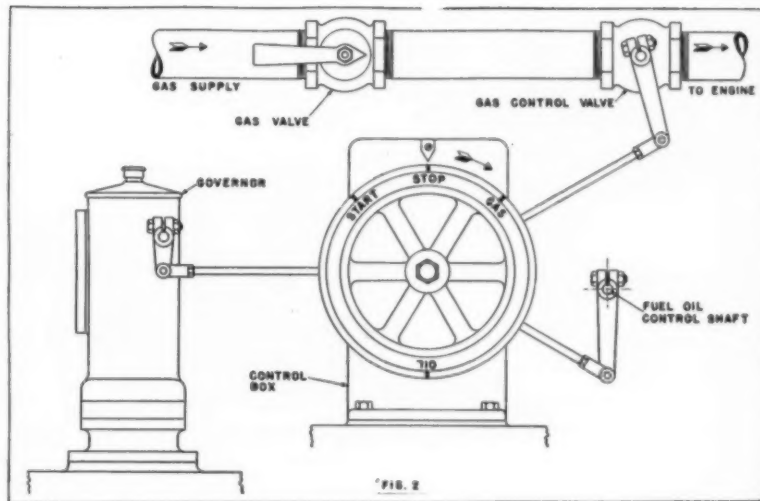
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Undoubtedly engine the existing chamber ture of gas and with 40 course, the mixture spark, a will not sidered the Diesel efficiency quired cycle an very lea

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Diagrammatic arrangement of the dual-fuel control hookup on a Cooper-Bessemer Diesel.



Enlarged diagram showing the method by which the controls are used to change from oil to gas, or vice versa.

injection was also used. The design of this engine and its performance are all a matter of record. When the possibility of supplying a high-pressure injection compressor was considered, together with the regular Diesel fuel oil injection means, it was decided that the design would not appeal commercially and, at least for the time being, should not be produced.

As stated above, no thought was given at that time to the possibility of allowing the gas to go in with the intake air, because of the assumption that it would pre-ignite. Actually, it is a bit difficult to get gas to ignite at 400 pounds compression, even if in a perfect mixture ratio, although one cannot be sure it will not ignite.

Undoubtedly, one reason for the Otto cycle engine being limited so low in compression is the existence of hot spots in the combustion chamber. Theoretically, at least, the temperature of ignition of a perfect mixture of natural gas and air is above the temperature reached with 400 pounds compression. There is, of course, a minimum gas-air ratio below which the mixture is not inflammable under atmospheric conditions, even when ignited with a spark, and also a maximum beyond which it will not ignite. The point that was not considered on the earliest work on burning gas on the Diesel cycle was that due to the inherent efficiency of that cycle the amount of gas required is considerably less than with the Otto cycle and the gas-air ratio at full load is still a very lean mixture, not too easily ignited.

It was, therefore, found possible to admit the gas with the engine air intake and still be completely free of any evidence of premature ignition. In fact, on very heavy overloads with natural gas, the mixture will not fire without

the pilot oil flame. It is, of course, possible to employ electrical ignition with this high compression, but electrical ignition under these conditions is not too reliable and the engine really requires a more positive flame anyway than can be provided electrically. Still further, the desirability of having an engine which can operate on either oil or gas makes the pilot oil ignition attractive.

It is obvious from the above that any engine built as a Diesel can be fitted to operate on gas, but of course engines built purely as spark-ignited gas engines cannot be converted to this principle.

Assuming a Diesel oil engine in operation and on load, if gas is admitted in the intake air the governor obviously will immediately reduce the amount of oil to compensate for the percentage being carried by the gas. It then merely becomes necessary to reduce the fuel oil injection to the desired minimum and then govern the percentage of gas according to load. Such a system is shown diagrammatically in Fig. 1. It is clear that to convert the oil engine to the gas engine it is, therefore, merely necessary to remove the fuel oil system from the governor, set it in the minimum position and connect the governor to the gas regulating valve. This is an extremely simple move and requires not more than a few minutes.

In the normal case, a shutdown of a few minutes to make this conversion would not be of any consequence. There are cases where the gas availability varies frequently, as for example, in sewage disposal plants. There it is desired to be able to instantly change from oil to gas, or vice versa, or even to maintain a mixture of the two where there is insufficient gas to pull

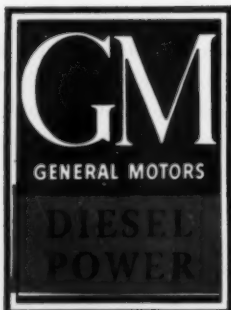
the load. To do this obviously requires some form of controls so that the operator can at will change from one fuel to the other, or even arrange it so that the engine automatically goes from one to the other as the gas availability fluctuates. Such controls are illustrated diagrammatically in Fig. 2. Fig. 3 shows a 675 horsepower Cooper-Bessemer Diesel engine with the gas-oil operating mechanism assembled on the control end.

There are hundreds of installations of Diesel engines, or of gas engines, which have been installed as convertible units, because of the uncertainty of the future of the particular fuel they are using. This is particularly true, of course, when installing an engine in a gas field of questionable future. The usual means of convertibility is by change of pistons, or of cylinder heads, or by means of spacers under the cylinder heads which will increase compression space when converting to gas. The conversion then consists of changing from an electrical ignition system to a fuel oil system or vice versa. The change obviously requires considerable time and involves expensive parts.

Since, in order to make such an engine convertible, it must be designed as a Diesel engine anyway, and it is therefore capable of withstanding the pressures of the Diesel cycle, it is obvious that the burning of gas on the Diesel cycle not only conserves gas, but also provides a very much simplified conversion. Still further, it provides a re-conversion to the original fuel at any time. The value of this latter is apparent when considering pipe line compressor engines for example, since it would be highly advantageous to convert to oil in critical times of gas shortage such as we have experienced quite recently.



Fleets of these tough customers are at work in the U. S. and
 British Navies. They're on the job all over the world. No
 need to repeat what dependable power means to them.
 They're powered with General Motors Diesel-Electric drive.



ENGINES...150 to 2000 H.P. **CLEVELAND DIESEL ENGINE DIVISION**, Cleveland 11

ENGINES.....15 to 250 H.P. **DETROIT DIESEL ENGINE DIVISION**, Detroit 23, MI

LOCOMOTIVES..... **ELECTRO-MOTIVE DIVISION**, La Grange

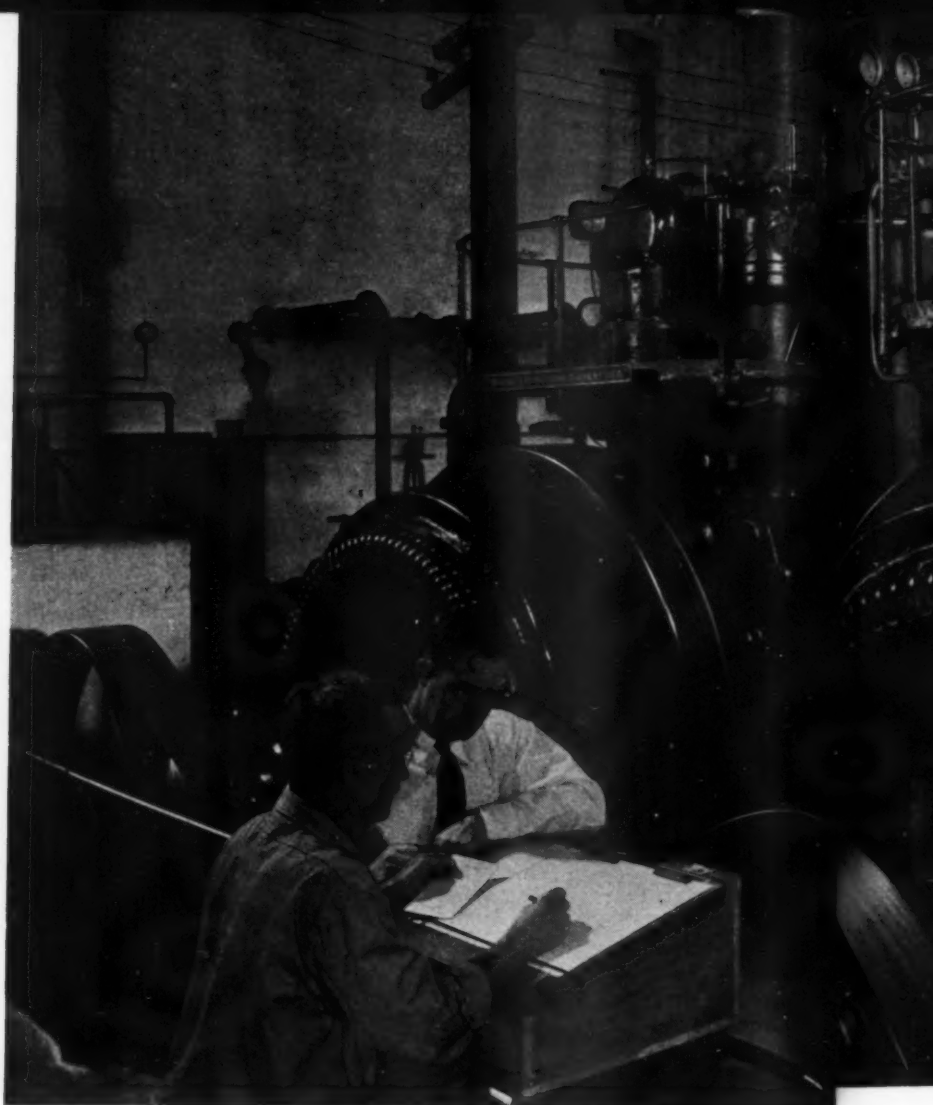
As the Sun never Sets on



KEEP AMERICA STRONG • BUY WAR BONDS

DIESEL PLANT DONATES ELECTRICITY TO SERVICE MEN'S FAMILIES— CHURCHES; ALSO MAKES PROFIT

By GORDON W. IVEY*



The author discusses operating records with a Gulf lubricating engineer at his two 600 hp. McIntosh & Seymour Diesels steadily grind out kilowatts

ONE day in December 1917 all 400 of the inhabitants of the town of Homestead, Florida had a grand celebration; a great event in the history of the town was taking place. The new Diesel light plant was to be put in operation and the town was to have its first electric lights.

This first engine was a 60 hp. De La Verne horizontal Diesel belted to a 30 kva. alternator. The next year a Fairbanks-Morse 150 hp. Diesel was bought and together the two machines supplied the town with electricity until 1923. In that year, these engines being overloaded, the council had to decide on additional power for the growing town. The city engineer recommended a steam plant, but on the advice of George Fuller, who was then the light plant superintendent, the council decided to continue the use of Diesels for prime movers. Two 225 hp. McIntosh and Seymour Diesels were bought and installed. The two smaller engines were sold.

* Superintendent, Homestead, Florida, Light and Water Plant.

In 1926 the load requirements had gone beyond the capacity of these two Diesels and the council bought two 600 hp. 6 cylinder Diesels of the same make. These machines were able to take care of the load until 1941 when the town, through the Schoonmaker Bros. bought an 825 hp. 4 cylinder McIntosh and Seymour from the village of Rockville Center, Long Island. This machine was erected and put in operation by the light plant crew in 1942. The town now has in its plant the two 600 hp. and one 825 hp. McIntosh & Seymour Diesels. Since the two 600's were started up in 1927 there has never been a shut-down due to prime mover trouble. In the hard years following the collapse of the Florida boom, the municipal light plant was the only source of revenue for the operating expenses of the town of Homestead.

Homestead is the center of the winter farming district of South Florida and has a normal population of 4000; however, the local air field has caused this figure to be increased to about 6000. Due to low domestic rates many electric ranges

have been installed in homes. Before the beginning of the war and its subsequent curtailment of extensions and sale of materials, approximately one half of the residences in town used electricity for cooking purposes.

The following figures are not large, as power plant revenue and expense statements go, but read on and see what the Homestead plant does for the community beside making a profit of better than \$10 per capita.

INCOME: Total Revenue	\$109,398.69
EXPENSES:	
Salaries	25,321.43
Fuel	28,421.24
Materials	7,446.59
Auto	250.97
Repairs	888.12
Sundry	529.50
Insurance	829.50
State Tax	1,260.93
Direct Expense	\$64,948.28

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Upper right: The Homestead plant looks as thrifty as it is. Right: The 825 hp. McIntosh & Seymour Diesel—third engine in the Homestead plant.

Bond Interest	3,185.00
Total Expense	\$68,133.28
PROFIT	\$41,265.41

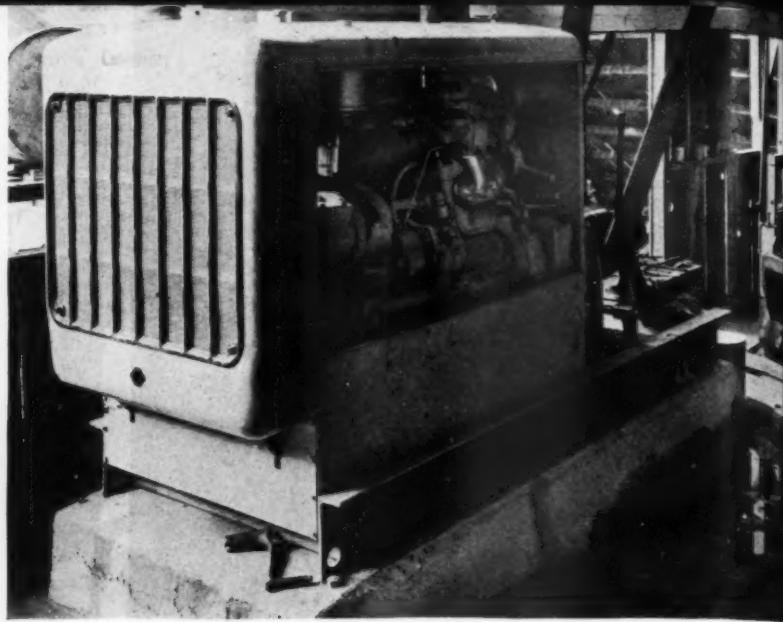
This report does not take into consideration the furnishing of current for approximately 50 kw. in street lights. The town also donates lights and water to all churches. In 1944 the town council authorized the donating of electricity and water to the families of enlisted men who have no other source of income, other than their government allotment.

Homestead will be the gate-way to one of the major postwar plans—the Everglades National Park. With this park and winter farming the town anticipates a considerable expansion after the war. This expansion, of course, includes all utilities. The citizens of Homestead are justly proud of the contributions of its Diesel driven municipal light plant to promote cleaner and safer living conditions for a growing community and a better postwar world.





Typical small mine in the Idaho hills, property of Pope Shenon Mines Company.



This 60 hp. Caterpillar Diesel recently replaced a steam plant in the Pope Shenon Mines at Salmon, Idaho.

REMOTE MINES DEPEND ON DIESELS

By JIM MEDFORD

MUCH of the strategic non-ferrous metal mining in the remote and isolated regions of the Western states is dependent upon the Diesel engine because of its freedom from expert attention and low cost for its high power output. This enables the smaller producer to operate at a reasonable margin of profit, adding tonnage to the ever-growing demand of this war of metals.

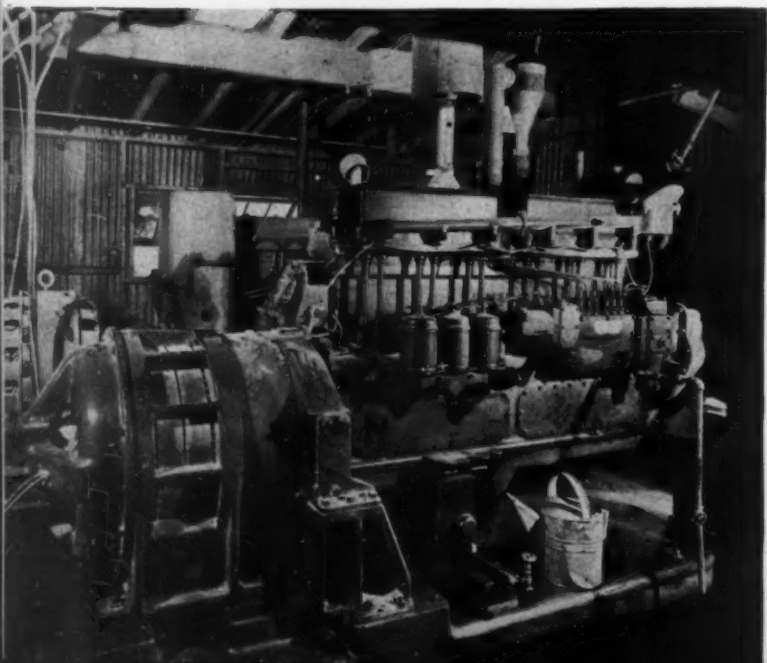
Copper, growing more and more in importance as the global strife drags on, had a domestic consumption in excess of three billion pounds in the first year of the war. Of this amount, 87% was produced in the United States. Typi-

cal of the small mine turning to the Diesel is the Pope Shenon Mines Company near Salmon, Idaho. They have added a Caterpillar 60 hp. engine for driving the 30-ton copper flotation mill machinery. Operating 24 hours of the day delivering full horsepower at 900 rpm., its fuel cost is approximately 18c per hour.

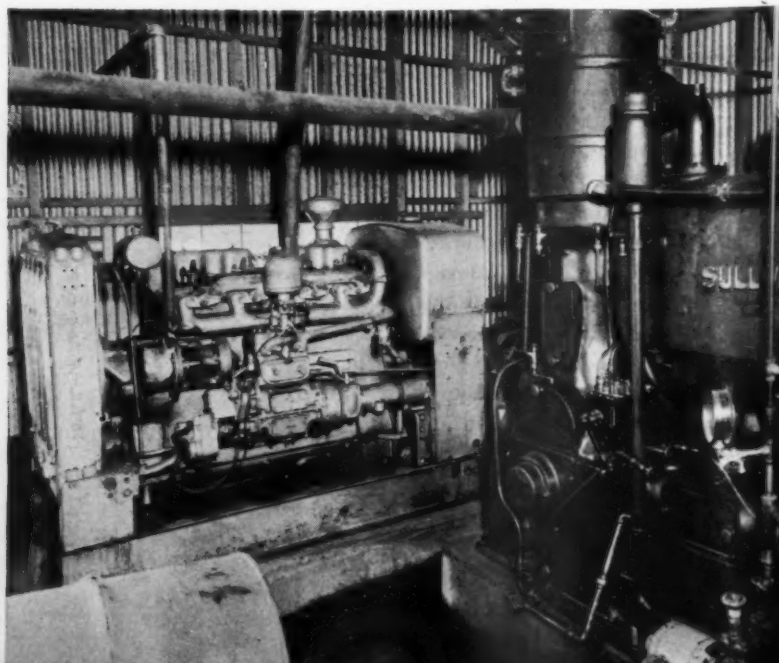
Silver, one of the semi-precious metallic elements, has made the State of Nevada famous. It produces a large share of the nation's 75,000,000 fine ounces, or about 25% of the world's output. Silver has taken up much of the slack caused by copper shortage with prices to 71c per ounce, U. S. Government purchase.

The William Donovan Mine at Silver City, Nevada, has installed a 60 hp. Caterpillar Diesel driving a Sullivan compressor supplying air to jackhammers, drills, etc., in its open pit silver mine. Located 6,000 feet above sea level, its low fuel cost is only \$1.12 for eight-hour shift. Another high-altitude silver mine using Diesels is that of the Westgate Mining & Milling Co., Fallon, Nevada. Here, two Caterpillar 100 hp. Diesels turning generators supply all power for mill, crusher, pumps, etc., operate 24 hours per day on one engine with the other cutting in for peak load on one shift of 8 hours at total cost of \$9.30—110 gallons of 8½-cent fuel—with mine located at 5,600 feet elevation.

Two Caterpillar Diesel generating units at the Fallon, Nevada mine of the Westgate M. & M. Company.



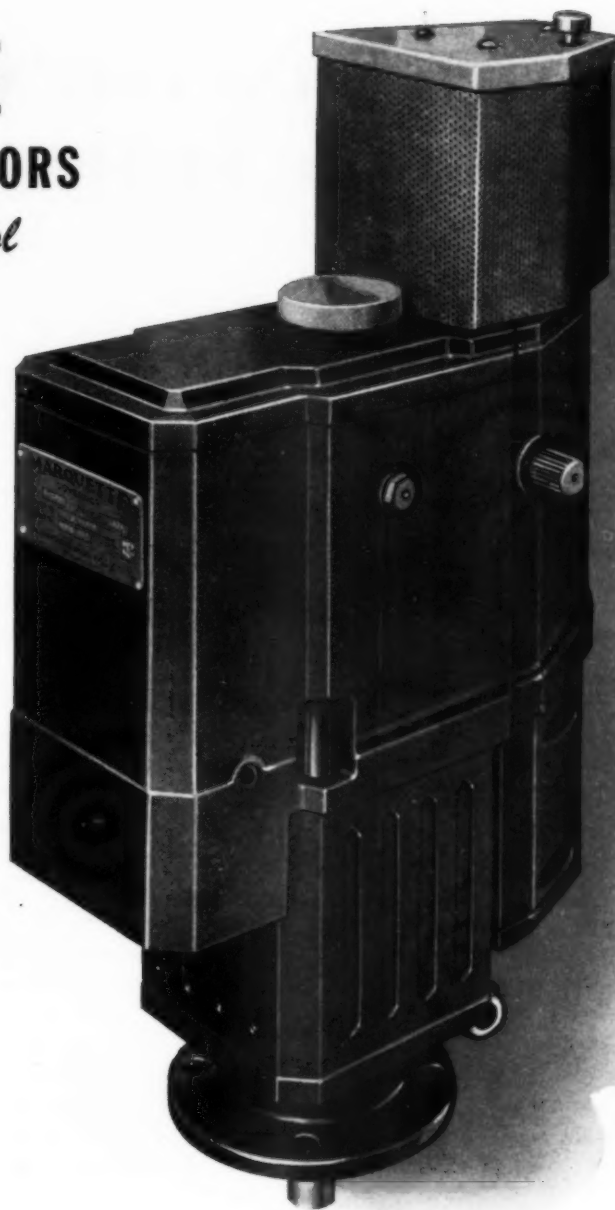
At the Silver City, Nevada mine of the William Donovan Co. this Caterpillar Diesel drives an air compressor.



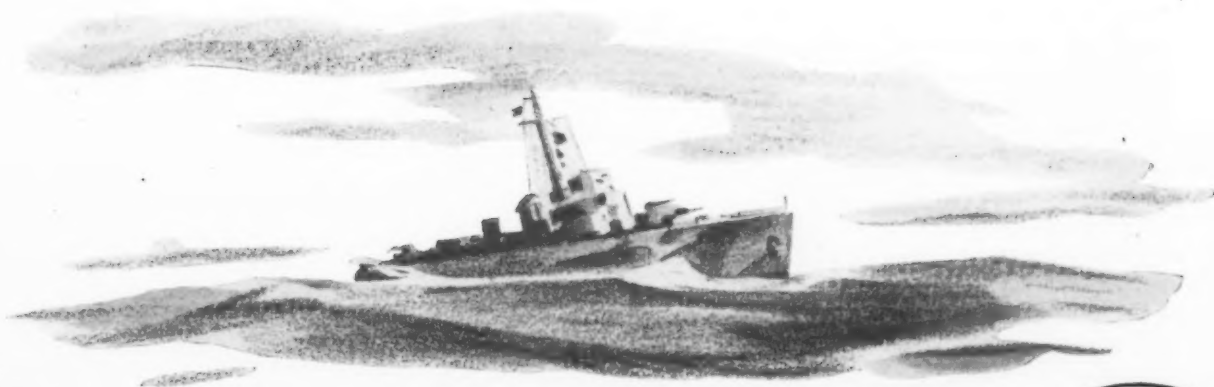
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FARM TRACTOR-NEEDS PROMISE FIVE YEARS' BUSINESS

By F. HAL HIGGINS

THE Cletrac Hercules Diesel tractor on V. R. Parrish's ranch east of Modesto, California, is a peach at meeting wartime farm power demands. So declares Mr. Parrish as he walked out into his famous peach orchard to show your Old Reporter the work it was doing in cultivating the orchard and disking in cover crop to increase fertility and irrigation water penetration.

"Peaches are my big crop," said Mr. Parrish. "Last year this orchard produced 2500 tons of peaches. In addition to handling all this orchard work, this Cletrac Diesel also cultivated the almond orchard and the alfalfa for the 40-cow dairy herd with small grain of about 50 acres for feed for cattle and 500 egg-laying hens. I figure we worked our Cletrac Diesel about 2,000 hours, getting in 10-hour days for practically every work day the weather permitted when ground was ready. Besides the regular levelling, ditching, disking, and plowing, there was power spraying. That's an exacting job for the tractor and it takes a real tractor to handle the big power sprayer when loaded and the orchard is water logged from the winter rains.

"It burned little fuel, being very economical compared with the old tractors. It burned 15 gallons in a 10-hour day in heavy disking that covered 30 acres in a day. The heavy ditch work on the farm was also done by this Diesel. One thing we farmers appreciate these days is the good dealer service we get from Comber & Mindach of Modesto."

A visit to the local dealership proved the farmer was right about the wartime service being given the Cletrac Diesel tractors on farms. "Yes, it's this way," explained Mr. Mindach, who proved to be an old tracktype tractor service man the writer had met at Stockton in earlier years before war. "About 90% of our business now is agricultural, though we have a little logging and contracting in the edge of the territory. Before the war, 65% of the business was new tractor sales. That means we had to make a violent readjustment and build up our shops for more service. We've done it and kept

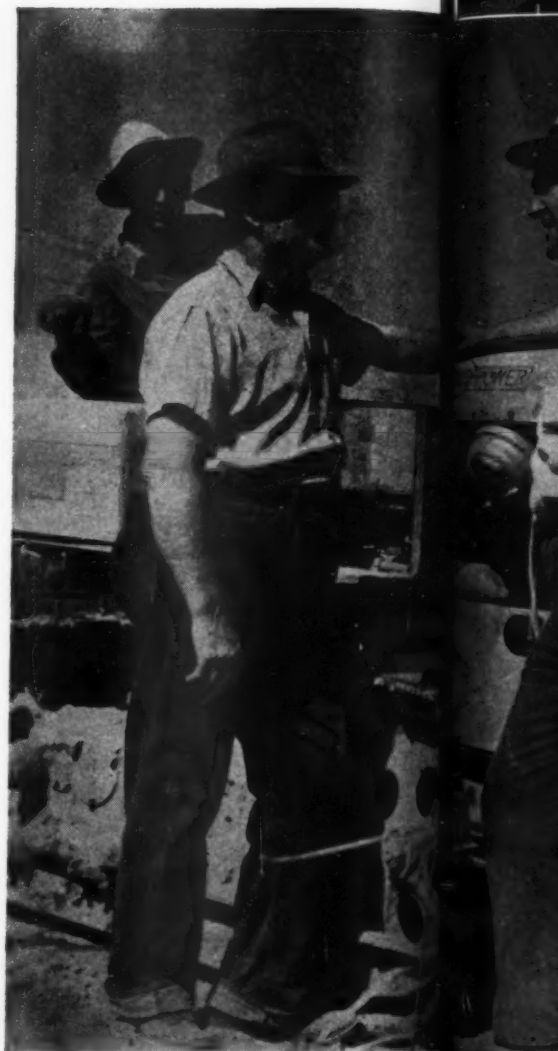
every Cletrac rolling, even back to the earliest models that go back to World War I. I have noticed rigs that were started running in 1919 coming in for overhaul and rebuilding for farm work now.

"Well, that means more service and less sales, which is the thing we think we have whipped in our shop because we are both service men in background and training. I had years with Mr. Grissel of Stockton, the oldest Cletrac dealer on the Coast. His sales and service in that area went up against the toughest farming and the hottest competition from rival crawler tractor dealers. So, looking back over the years we fought for sales up there, I can see we can now thank our stars for that kind of realistic training. It is paying off, for this is a time when if you can't make the service of old tractors pay, you can't stay in business.

"We now have eleven service men and are ready to enlarge the service shop by adding on a new building to increase our business to cover half a city block of 20,000 square feet of floor space. It will all be roofed over to make it comfortable for our mechanics and welders.

"Naturally, we have to pay the wage scale and better to get good men. Good men pay out for us, as they get the work out. We had to make some specialists in order to give the pay rate to them they wanted and earned. The wages have gone up over 100% compared to pre-war scales. We used to get all the men we wanted at 60 cents an hour but they cost \$1 and up to \$1.45 now."

As to the future for Diesels in this territory, Mr. Mindach thinks it is unlimited. Never has the Diesel tractor been so appreciated as now, he finds, and as fast as smaller ones are on the market to power combines and other farm machines they will buy them. Every farmer with one wants more to replace his obsolete and wornout models and increase his man power efficiency, he says. There should be at least five years of business in sight to keep the dealers going as fast as they get the post-war Diesels they now are waiting to buy.



Mr. Mindach, right, talks over the peach crop with V. R. Parrish, owner of the orchard and Cletrac, Hercules Diesel engined tractor that does all the heavy work on the Parrish ranch, near Modesto, California.

Here the Diesel tractor is negotiating a steep pitch while dragging a heavy double disk through the orchard.

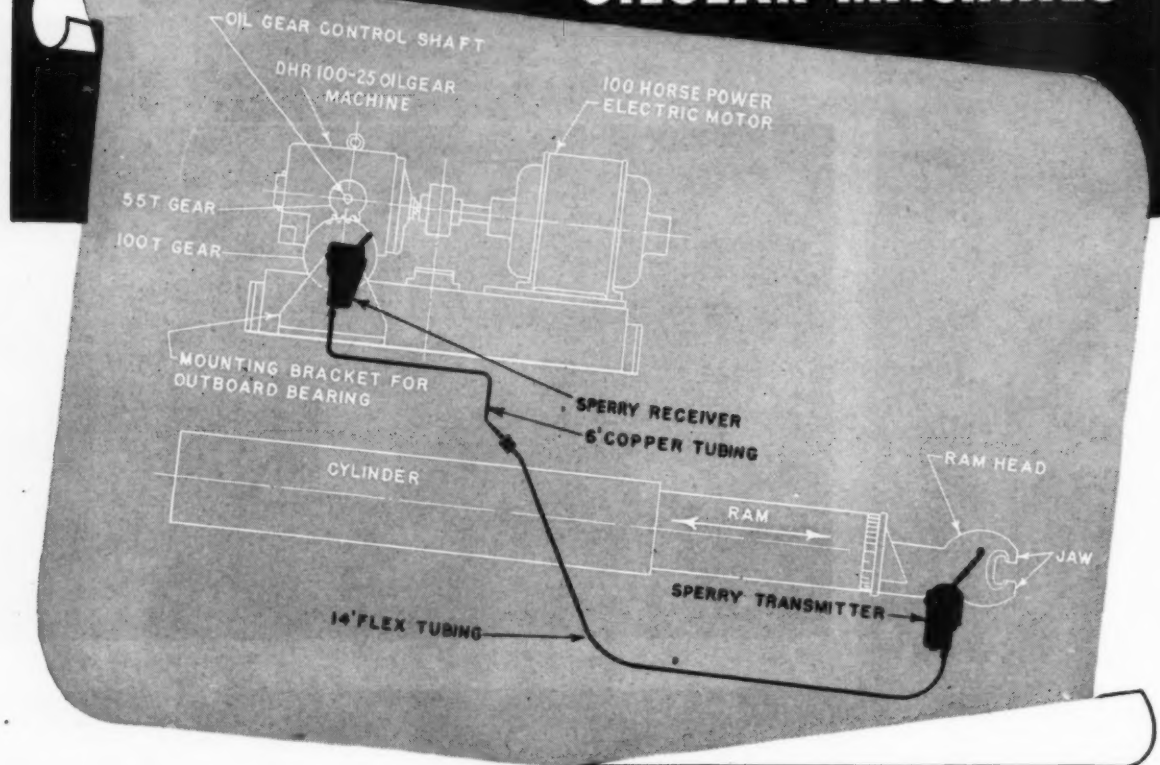


The service shop of Comber and Mindach, Cletrac and Massey-Harris Dealers, serving farmers, loggers and contractors in San Joaquin Valley, California.

Here the farmer buys parts to keep his aging tractor going until the Powers say he can have a new one.



SPERRY HYDRAULIC CONTROLS provide *Precision Operation* of OILGEAR MACHINES



SPERRY HYDRAULIC CONTROLS are used by the Aluminum Company of America's Massena Plant on a 250,000 lb. Rod and Bar Stretching Machine, as shown above. A Transmitter mounted on the moving Ram Head remains constantly at the operator's hand, allowing him instant control of the stationary Receiver. The motion of the Receiver is transmitted through a gear and pinion to the rotary pilot valve which, in turn, controls the pump stroke of the Oilgear Machine.

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PROBLEM: Original installation of mechanical controls presented following difficulties:

- Control set-up limited operator's vision.
- High-accuracy control unobtainable.
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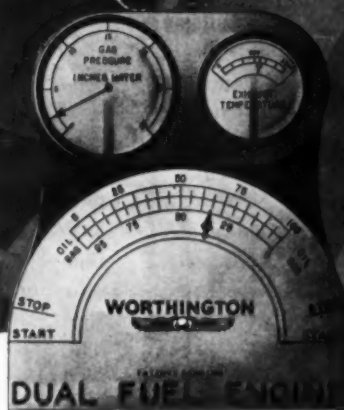
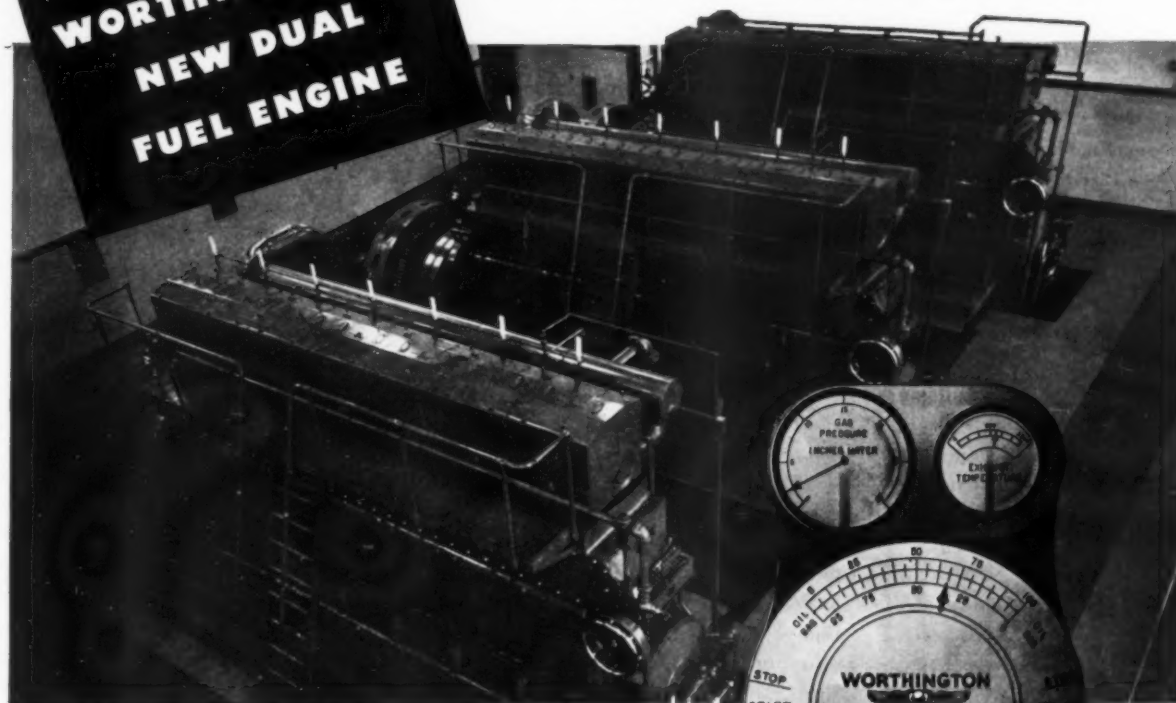
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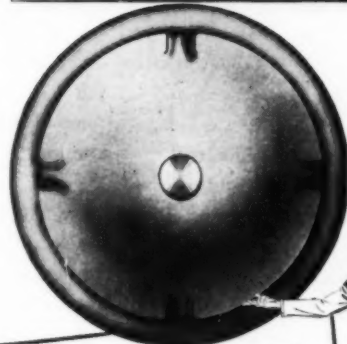
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LEGAL NEWS

Conducted by LEO T. PARKER*

THE higher courts are currently rendering numerous decisions on interesting aspects of Diesel engine law. The fact that present day higher courts render distinctly modern decisions which very frequently reverse old and well established law, make these new decisions most important. Old decisions should *not* be relied upon. This is so, particularly, because present day conditions and circumstances have resulted in the courts rendering unusual decisions on varied phases of law, and new law is in making.

Service Employee Burned to Death

Generally speaking, no employee is entitled to recover damages or compensation for an injury *not* sustained "while working" within the scope of the employment. However, with respect to "service" men the situation is different if they are subject to call by their employers.

For example, in *Souza's Case*, 55 N. E. (2d) 111, reported August, 1944, it was shown that an employee lost his life in a fire while asleep in a rooming house where he was spending the night.

The question presented the higher court was whether the employee's dependents were entitled to recover compensation under the State Workmen's Compensation Act.

The facts are as follows: The employee was employed by the Cooper-Bessemer Corporation, whose business was the manufacture and sale of Diesel marine engines. The employee's work was that of a "service man" in connection with the installation and repair of his employer's engines. His work called him to various places and required him from time to time to be away from home nights. He worked "on a basis" of forty-four hours a week, but neither he nor the company adhered to this schedule. He was required to work whenever he was called upon and was expected to expend as much time as the work in hand required. In any emergency, whether during or after regular hours, he was expected to put in as much of his time and attention as in his judgment the situation required. He "had no stated or definite hours of work each day, and, in the event of necessity or emergency, was, even after the regular hours, subject to the company's call at any time." His employment was "of a continuous nature." He

was paid a salary, and in addition, when away from home, he was paid his expenses for room, board, and transportation. And also he was free to select his own lodging place. His employer knew this.

In view of this testimony the higher court held the employee's dependents entitled to receive payments of compensation under the State Workmen's Compensation Act. The court held that the employee was within the scope of his employment when he was burned to death in the lodging house. This court said:

"In such cases the inquiry has been whether his employment exposed him to the risk, whatever it was, which actually caused the injury. . . . In our opinion the deceased employee, while as an incident of his employment he was asleep subject to call in a place paid for by his employer and selected according to the conditions imposed by the nature of the employment, met injury and death arising out of and in the course of his employment."

Therefore, this modern decision establishes law that an employee, in order to be entitled to compensation, need not necessarily be engaged in the actual performance of work at the moment of injury. It is enough if he is occupying himself consistently with his contract of hire in some manner pertaining to or incidental to his employment.

Also, see *Caswell's Case*, 26 N. E. (2d) 328, where the wall of a building, in which an employee was at work, was caused to fall upon him by the violence of a hurricane.

It was argued that the injured employee was not entitled to recover compensation because the injury did not arise from the employment. However, the higher court allowed full compensation, and said:

"It (the injury) need not arise out of the nature of the employment. An injury arises out of the employment if it arises out of the nature, conditions, obligations or incidents of the employment."

What Is Accidental Injury?

The usual State Workmen's Compensation Act does not provide for compensation to employees who are "overworked." However, a modern

higher court has held that an injury resulting from overwork is compensable under the laws relating to accidents.

For illustration, in *Caddy v. R. Maturi and Company*, 14 N. W. (2d) 393, reported July, 1944, a person named Caddy was employed to operate a Caterpillar Diesel tractor. The tractor weighed from 18 to 20 tons and was equipped with a large adjustable steel blade weighing five or six tons for the purpose of moving dirt and rock. Caddy had been engaged in the same work for four or five years.

One day while he was engaged in changing the angle of the steel blade, an operation requiring considerable exertion in a "stooped over" position, he felt "a catch" in his lower back. He completed his work that day, but his back commenced to bother him immediately thereafter. He returned to work the following day but experienced periodic pain in his back, and he was unable to continue the work of operating the tractor. He sued to recover compensation under the State Workmen's Compensation Act. In holding Caddy entitled to a recovery the higher court said that although disability due to overwork is not to be covered by the Act yet where overwork results in weakening the physical structure of some part of the body so that it subsequently collapses, or gives way because of some unusual strain, disability resulting therefrom is deemed an accidental injury.

Must Testify

It is well known that no person may be compelled to testify during any trial where such testimony may incriminate this witness. However, this rule of law does not protect public officials in suits filed personally against them for recovery of financial losses to a state, county or city.

For example, in *Shumpert v. Lee County*, 20 So. (2d) 82, reported January, 1945, suit was filed by a county against a certain county official to collect personally for loss to the county resulting from use of Diesel equipment for benefit of individuals. The testimony proved that the county officials permitted use of a tractor, and other construction equipment belonging to the county, for construction of private pools, ponds, lakes, roads and ditches for individuals and friends in which the public had no interest. . . . And now please turn to page 86 . . .

* Attorney at Law, Cincinnati, Ohio



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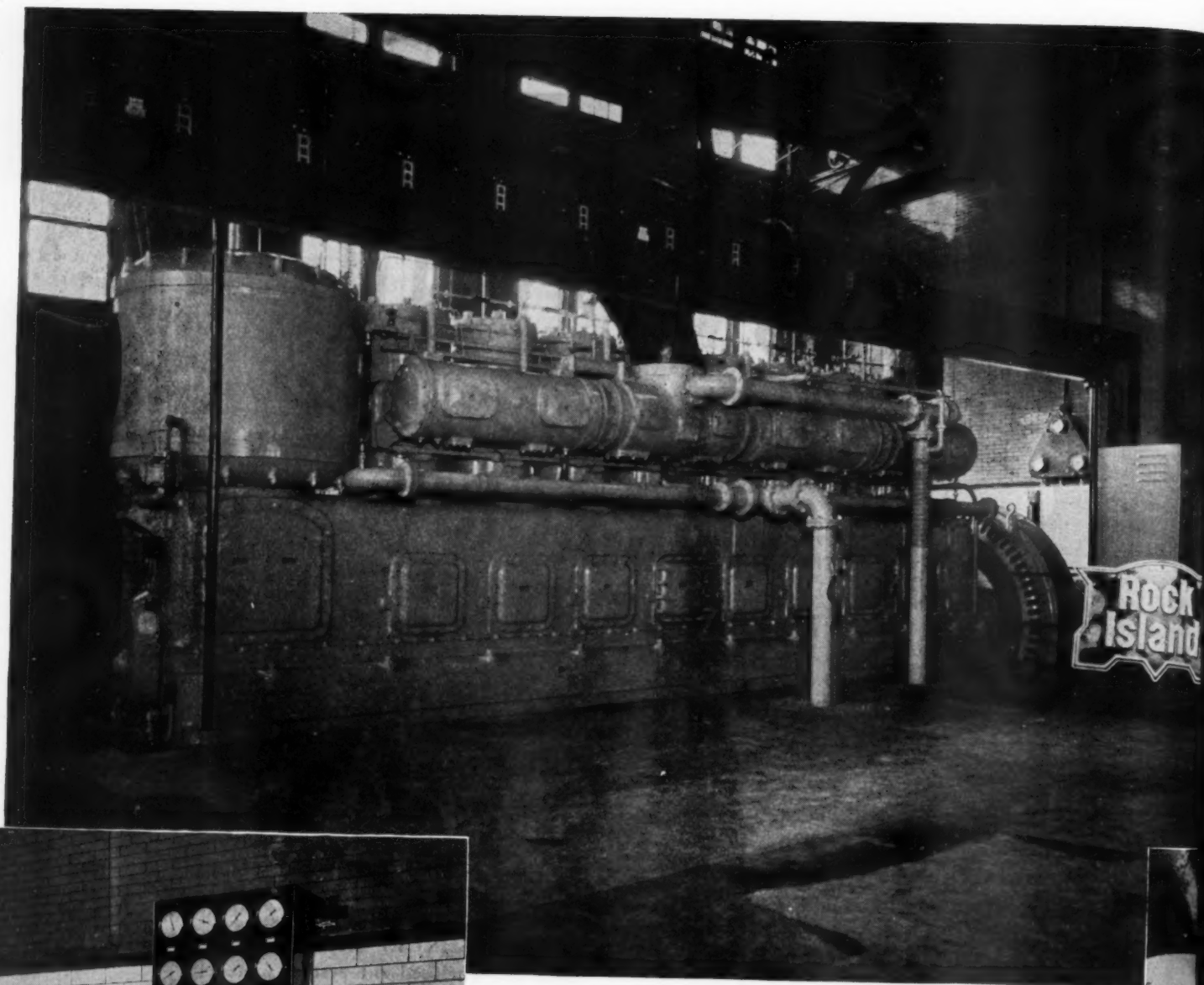
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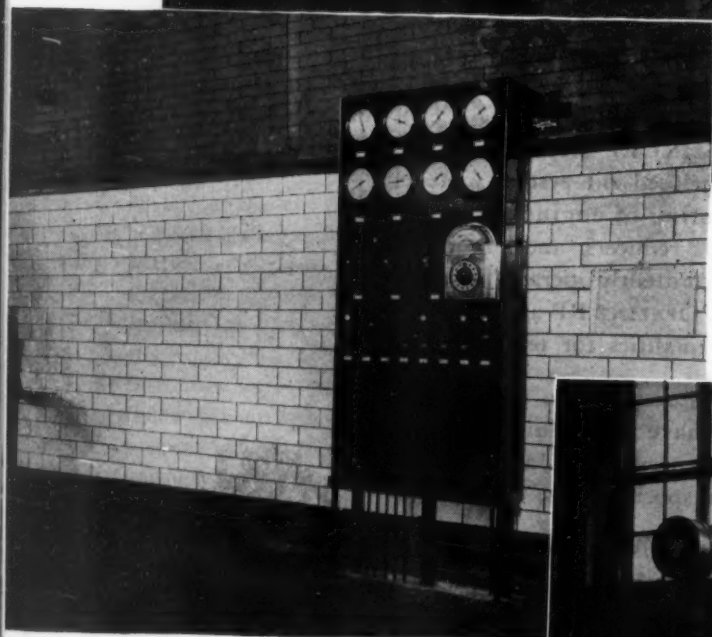
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The 8-cylinder, 1600 hp. Fairbanks-Morse Diesel that now carries the main operating load in the Rock Island shops in Silvis, Illinois.



Above: The Diesel gauge board with pyrometer and starting buttons for various engine service pumps—nozzle tester seen left. Right: Two new panels—extreme right—have been added to the switchboard for the Diesel.



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DIESEL REPLACES TRADITIONAL STEAM IN R. R. SHOPS

By L. A. HARLOW

AMONG the first large railroad maintenance shops in the United States to employ a Diesel for general power generation is the Chicago, Rock Island and Pacific shop at Silvis, Illinois, where early in January the installation of a Fairbanks-Morse Diesel generating unit was completed. The new engine replaces an old steam unit and is of sufficient capacity to take on the entire electrical load of the plant. The eight cylinder, 16 x 20, 1600 hp. Diesel operates at 300 rpm. and is direct-connected to a 3-phase 60-cycle 440-volt generator rated 1125 kw. at 0.8 power factor. Excitation is provided by a direct-connected unit.

It is unusual for a generator of this capacity to deliver its power at the low level of 440 volts. Because of the resulting high amperage, the current must be carried on bus-bar from the alternator, and this bus, enclosed in perforated metal casing, emerges from the circuit breaker cabinet and travels over the engine leads to the switchboard on the opposite wall.

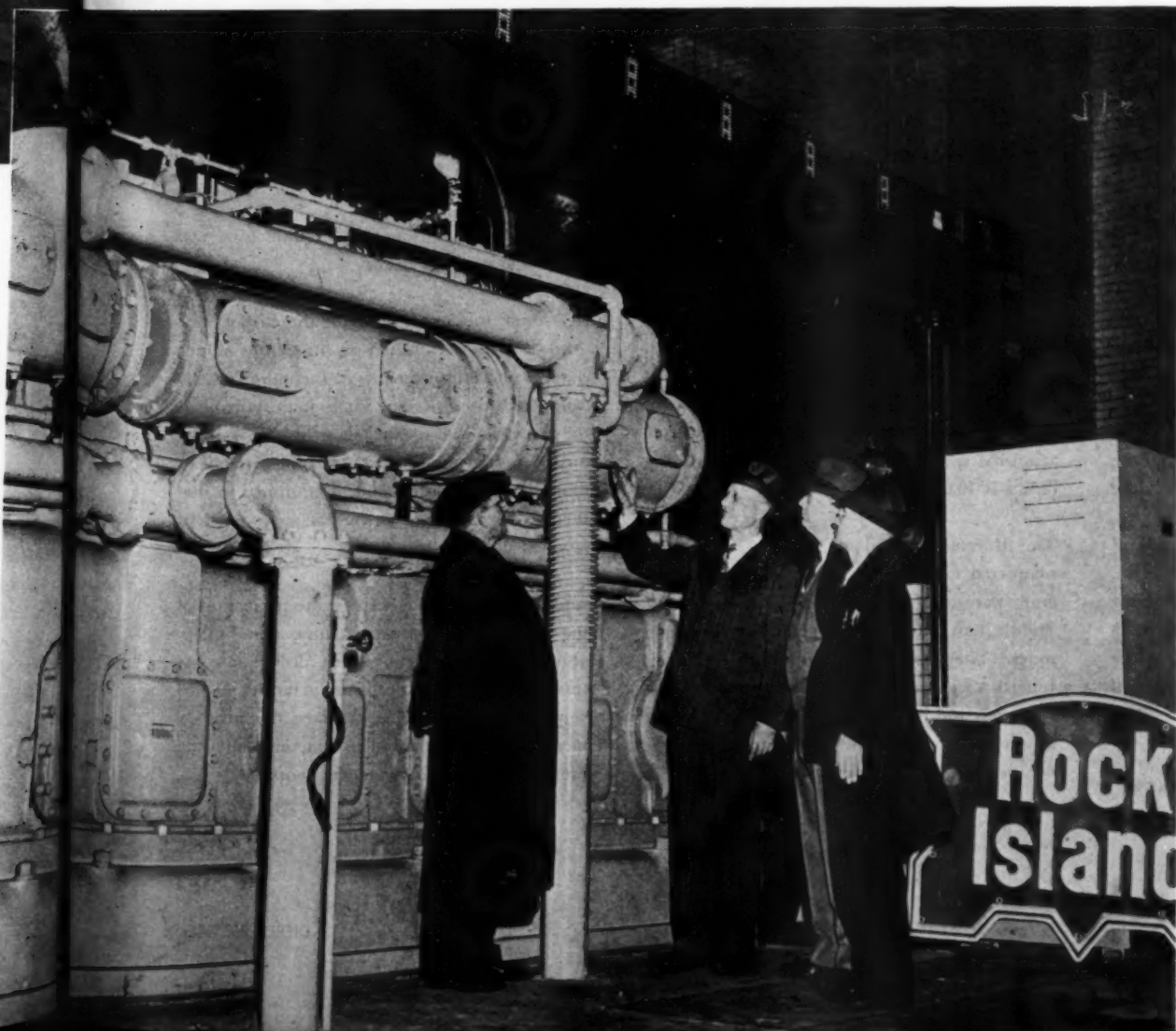
Available for the installation was a very spacious room, and assembly was considerably facilitated by the existence overhead of a permanent travelling crane. The somewhat crowded basement did not provide much headroom, and for this reason the exhaust pipe, the air intake pipe and the bus of the new generating unit are all above the floor—amply high to provide easy passage below.

Accessory to the new Diesel are heat exchangers for jacket water and lubricating oil. A five-inch centrifugal pump driven by a 10 hp. motor handles jacket water, and a similar pump with 20 hp.-motor-drive circulates raw water. The latter is obtained either from a spray pond or from a well equipped with a deep-well turbine pump. Another five-inch centrifugal is available as a stand-by for either soft or raw water, as its piping system enables the cutting in of either system. Pumps and heat exchangers are located in the basement of the building close by the foundation of the engine—pumps and

motors are both of Fairbanks-Morse design and manufacture.

The pond which constitutes one of the two sources of raw water is replenished from the nearby Mississippi River, and after treatment it can also be used as feed water in steam boilers and for locomotive tender tanks. Its summer excess of heat is dissipated by spray nozzles on the return system. The well water offers a temperature advantage for use through the Diesel heat exchangers, but it must be wasted after use as it is too hard for redelivery to the spray pond.

The plant at Silvis is under the general supervision of Superintendent of Shops L. D. Richards, and under direct charge of Chief Engineer Edward Kendall. Mr. Kendall has been identified with Silvis operations for many years, and it is doubtful that the new Diesel could start its Rock Island service under more competent hands than his.



Left to right discussing the F-M Diesel are: A. E. Ganzert, E. E. for Rock Island; W. L. Nies, F-M sales engineer; L. C. Bowes, engineer of shop, plans and machinery and Edward Kendall, chief engineer of the Silvis shops.

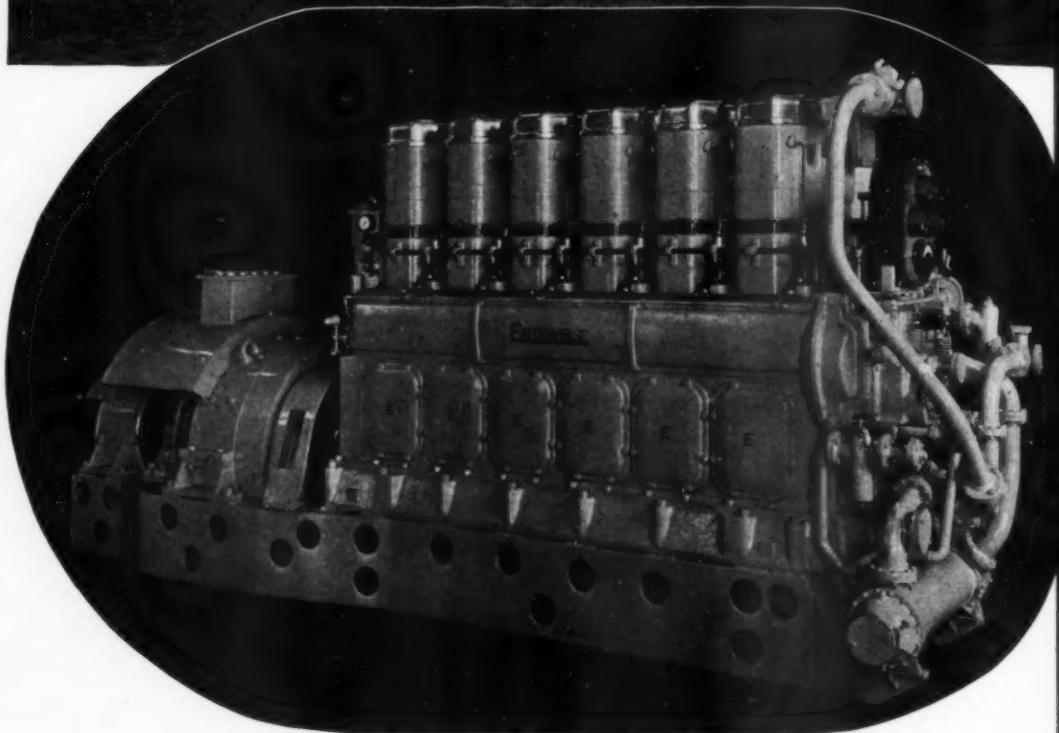
"MORMACDALE" ENGINEER PRAISES AUXILIARY DIESELS

INTERESTING auxiliary engine performance reports given by O. T. Reddin, Chief Engineer of the motorship *Mormacdale*, one of the first of a fleet of forty-six CI-A design cargo ships built for the Maritime Commission by the Pennsylvania Shipyards, Beaumont, Texas, furnish additional records of the successful service provided by this type of vessel in wartime operations.

Chief Engineer Reddin was highly enthusiastic over the efficient operation of the two Enterprise-Westinghouse generator sets which comprise the auxiliary plant of the *Mormacdale*. In commenting on the records of the two engines, which are Enterprise six-cylinder models, he said, "They have seen better than 8000 hours of service, and their performance has greatly pleased me. The maximum liner wear in any cylinder just below the travel of top compression ring is .008 in.

"The two Enterprise engines are operating on a weekly alternating schedule, as one engine usually furnishes ample power to take care of the load requirements. When an engine is shut down for a week, lubricating oil is pumped into a settling tank. After settling, it is then centrifuged and used for makeup oil in the two maintain propulsion Nordberg Diesels. Thus the auxiliary power engines get a complete change of lubricating oil (Gargoyle DTE Marine oil No. 3) for every week of operation."

The Enterprise-Westinghouse generator sets on the CI-A Diesel vessels comprise the neatest and most compact arrangement of auxiliary plant found in any of the Maritime Commission ships. The two units, each of 250 kw. capacity, are placed side by side, with ample working space around them and the space above the engines kept clear of piping. Each, of course, is a self-contained unit, with water and oil pumps and heat exchangers built into them. The engine and generator are mounted on a common steel sub-base and the engine drives all of its own auxiliaries including sea water pumps, fresh water pumps, lubricating oil pumps, and fuel transfer pumps. With 12-in. bore by 15-in. stroke, each engine is rated 450 hp. at 450 rpm.



Top view: CI-A vessel, "*Mormacdale*," powered by Nordberg main Diesels and Enterprise auxiliary Diesel generating units — shop view of the latter shown above.

The ships of CI-A design represent an important phase of the great program of Diesel vessel construction being carried on by the Maritime Commission. With a hull 414 feet long, beam of 60 feet, and a load draft of 23.6 feet, these craft have a deadweight of 7416 tons. Equipped with two 2000-hp. Nordberg Diesel engines for main propulsion, they have a normal speed of 14 knots and their cruising radius is 10,000 miles.

The *Mormacdale* and other of her sister ships completed early in the CI-A construction program were assigned to carrying cargoes to the Middle East, Mediterranean and other danger zones. They bore the brunt of the job until Liberties were available to assist them in these strenuous and hazardous operations. Before the advent of convoys, they sailed out into the oceans alone, and stories of their many heroic

deeds and seemingly insurmountable feats will glorify the pages of history.

It is these war experiences of the earlier-built ships that have resulted in numerous minor changes and improvements in the more recently completed vessels. One such improvement is the provision of means of escape in case of torpedoing or bombing. Every compartment or room, even the bath rooms, is equipped so that there is no danger of anyone being trapped by jammed doors or hatches.

Another war lesson is seen in the protection of the pilot house against machine gun bullets, also in the manner in which deck house entrances to the outer decks are arranged to prevent light from showing. In fact, this arrangement is so good that it is sometimes difficult, even in daylight, to locate the doors.

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SUPERVISING & OPERATING ENGINEERS' SECTION

"CO-OPERATION AND BREAKDOWNS"

Conducted by R. L. GREGORY*

BREAKDOWNS are costly, not only from the standpoint of money involved and spent in making repairs, man hours required for those repairs, but also from the standpoint of inconvenience to those dependent upon the plant for power and light in maintaining production and a further loss of man hours, which should be kept to a minimum under present economic conditions and shortage of manpower.

When a breakdown occurs in a plant, the consumer is forced to revise production schedules and under our present system of production in industry, most plant functions are departmentally dependent one upon another, so that the loss of production in one department or plant will eventually affect others. Eventually many man hours will be lost as a result.

On several occasions, the writer has stressed the point, that breakdowns in prime mover equipment, especially Diesels, can be traced to one of two existing conditions. First, the lack of a well organized inspection and maintenance schedule, properly carried out, the cause of which can be traced to several sources, and secondly the failure of equipment in operation, due to fatigue, which cannot be ascertained while units are in operation. Many engines cannot be spared for outage, due to operating schedules or lack of standby equipment, to allow for periodical inspection and checkup.

Now let us just look over the first cause of breakdowns. Unfortunately there are still many supervisors and engineers, who will not organize and pursue a sound policy of inspection and maintenance. They operate the plants under them in much the same manner that they carry on their daily individual movements, in a haphazard, lackaday, sort of manner, their motto being, "Why worry, as long as they keep going"? Their own personal interest and pursuits take precedence over plant problems, giving little thought to the fellow on the other end of the line, who is honestly endeavoring to keep up his production schedule and output. This is the height of lack of co-operation, which is so badly needed in our present war situation.

* Chief Engineer, Municipal Water and Light Plant, Hillsdale, Michigan.

Then there is the supervisor or engineer, willing and hardworking, but who is hampered in his efforts, by the unwillingness of the "Powers Higher Up" to open up the purse strings and furnish him with vital and needed materials in order to follow an organized maintenance program. He may make his inspections promptly, foresee trouble and make his recommendations, but they fall on deaf ears. Such a situation is more to be pitied than criticized, because in nine cases out of ten, where such a condition exists, the Powers Higher Up, are laymen, unfamiliar with plant problems, and unless they can be properly shown the necessity of this material, are likely to feel it an unnecessary expenditure. They are therefore not to be criticized unless they can be shown the advantage of necessary equipment which would insure them against breakdowns.

We might even go a step farther and lay the fault of some of our breakdowns and delays at the foot of the manufacturer or vendor of repair parts. Some might say, especially the vendor, "What an asinine statement to make, how can we be accused of breakdowns and delay of repairs"? He can easily hamper your maintenance program by furnishing you with unsuitable materials, by not thoroughly checking your requirements and furnishing proper details of repairs. Let me just give you a concrete example of the above.

Not long ago, a certain plant engineer, saw his way clear to cut outage for certain repairs and facilitate making repairs to a unit vitally necessary to plant output. He felt that by acquiring certain spare parts in his stock, he could assemble them in spare time and have them ready for immediate installation, should necessity require them on a certain overhaul job, thus cutting the outage time by several hours. He would remove the old parts, install the new assembly and have the plant back in operation, and could then take his time in reconditioning the removed parts and place them back in stock before they would again be needed.

The parts required would cost several hundred dollars, and when the proposition was placed before the management, and assurance given

that outage of a unit badly needed would be cut to a minimum, the management agreed that such a procedure would be good insurance and would facilitate quick repairs. The parts were then promptly ordered, and arrived in due time.

However when the engineer began to assemble the parts, he discovered that a change had been made in the design of certain parts of the equipment, it being different from that originally furnished on the unit. Due to this change in design, other parts would have to be furnished before the assembly could be used. This called for an interchange of correspondence with the vendor, all of which took time. Unfortunately before the additional equipment could arrive, a change was necessitated in this particular assembly, which required removal of the old parts reconditioning and reinstalling. The outage was for several hours, and the purpose for which these new parts were ordered, namely to facilitate quick repairs, was defeated.

Now of course we all realize that manufacturers are not infallible, and due to inexperienced help commit sins of omission the same as any one else. But had the order for these repair parts been given due consideration, it would have been noted that due to change of design, the new parts could not be used without additional equipment, of which the engineer was unaware. But here again the human element entered the picture and necessitated the checking and rechecking of the repairs in order that they would properly function when installed. Now as to the second cause of breakdowns, namely those caused by mechanical failures during operation. Many of these breakdowns could be avoided if proper outage time could be given for inspection. Most units do require at least an annual overhaul and at that time it is well to completely inspect parts of the unit which ordinarily are inaccessible in weekend outages. I refer to such parts as bearings, guides, cross heads and other parts which require complete dismantling in order to ascertain their true mechanical state. With short outages it is almost impossible to make a satisfactory inspection of such parts. What then is the best policy to pursue in order to cut outages And now please turn to page 86

MUSKEGON Type
IBR "Inside Bevel
Radiused"

NO-SCUFF
Compression
Ring

NEW...

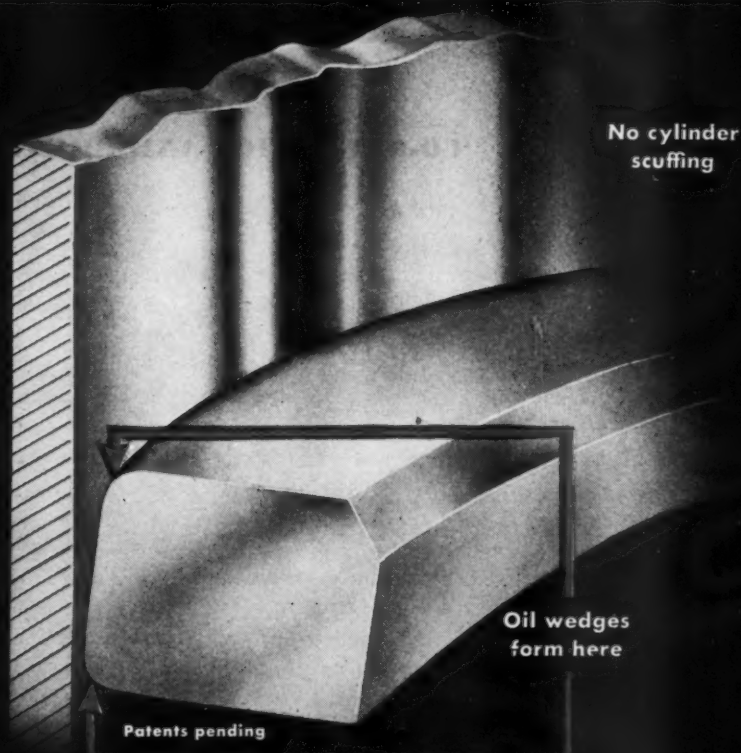
STOP cylinder and ring scuffing!



Send for Engineer-
ing Data bulletin set-
ting forth full details
of this new NO-SCUFF
piston ring.

MUSKEGON

Piston Rings



Radiused Corners Eliminate Scuffing—Reduce Wear

Muskegon's search for a means by which to reduce cylinder and ring scuffing has produced a new ring design of great promise. This ring, named "No-Scuff", has three main features:

- 1 Its material is a special alloy iron.
- 2 Its upper and lower face edges are radiused instead of being sharp.
- 3 It has torsional twist action as a result of its inside bevel.

Tests of the design in several makes of automotive engines indicate the virtual elimination of cylinder and ring scuffing with a reduction of wear of all rings on the piston.

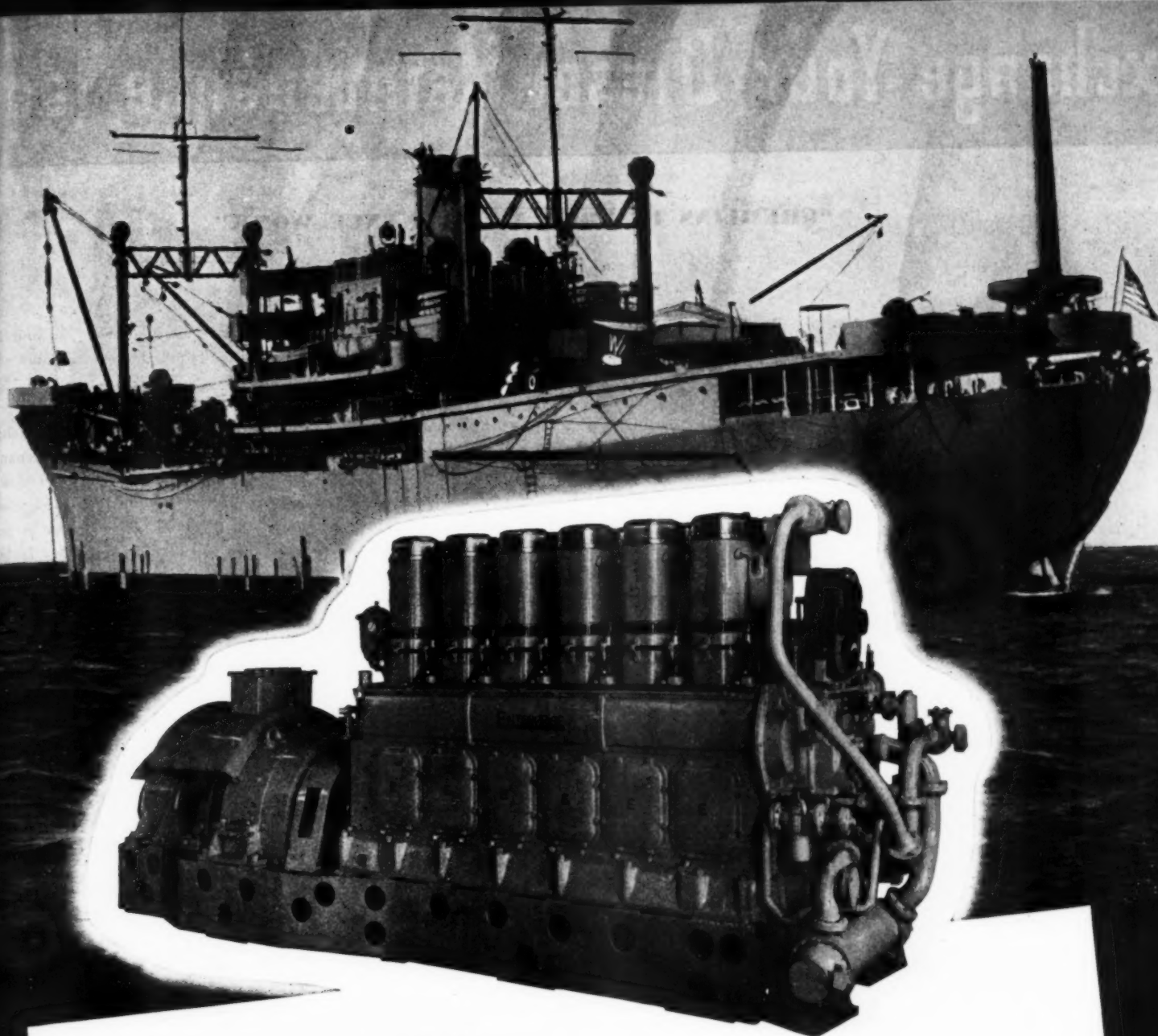
This has been accomplished without increased blow-by or oil consumption.

The rounded face edges permit a thin oil wedge to form between the ring and cylinder, spreading a complete film of lubricant throughout the area of ring travel. The lower edge bears heavily against the cylinder, holding the lubricating film to minimum thickness and sealing off blow-by.

This design is used in the top piston grooves in combination with the proper oil control ring, which must be carefully selected for each engine type to assure desired results.

MUSKEGON PISTON RING CO.
MUSKEGON, MICHIGAN
PLANTS AT MUSKEGON AND SPARTA

"THE ENGINE BUILDERS' SOURCE FOR PISTON RINGS"



AUXILIARY POWER FOR ATTACKING EAGLES

"Scratch one flat-top," the naval pilot's exultant shout of Victory, starts with Enterprise Diesel Engines furnishing power on Sea Plane Tenders ... mother ships for sea-going eagles. On these ships Enterprise Diesel Engines are supplying the smooth unfaltering auxiliary power, day after day, months without pause, vital to refueling, loading ammunition, running aircraft recovery cranes, and other tasks necessary in keeping pilots and planes flying into the attack.

Engineered to bear the brunt of heavy loads, Enterprise Standard and Supercharged Diesel Engines are successfully handling difficult missions all over the globe. Designed with simplicity and compactness to meet the most exacting needs of marine operations, they burn heavy fuel oils with outstanding economy. Enterprise Diesel Engines, used either for main propulsion, or auxiliary power, are writing new chapters in the annals of American Maritime Commerce.

ENTERPRISE ENGINE & FOUNDRY CO.

SAN FRANCISCO
SEATTLE



WASHINGTON, D.C.
NEW YORK

Exchange Your Diesel Maintenance Ideas

"GREMLINS IN YOUR MAINTENANCE WORK"

Conducted by R. L. GREGORY

Editor's Note: In this department we provide a meeting place where Diesel and Gas engine operators may exchange mutually helpful maintenance experiences to keep our engines in top condition. Mr. Gregory edits your material and adds constructive suggestions from his own wide experience. This is your department—mail your contributions direct to DIESEL PROGRESS.

WE have all heard and read a great deal about those little mythical fellows called, "Gremlins," who are supposed to make their appearances at the most inopportune times and start "Gumming up the Works" to use a slang expression. But anyone who has ever had the responsibility of operating and maintaining a power plant, Diesel or otherwise, is thoroughly familiar with the whole gremlin family, and especially, the king of all gremlins, old "Bottleneck."

These "Gremlins" take on many forms and take in many situations, from an old worn out useless tool, to a valve installed in the wrong place, or the absence of any valve at all where one should have been installed. They are also healthy co-workers of construction men who are unfamiliar with operating problems and conditions, and they always make their appearance just when a quick maintenance job on some piece of equipment is essential to keeping things rolling. Now what is this building up to, you may ask?

In designing a new plant or making additions to a plant already in operation, those in charge must keep two viewpoints in mind when checking over prints of layouts and designs. The first being the effect upon operating conditions in the plant, and the second which is even more essential than the first, the effect upon your maintenance program. Much of the work of installation of new plants or the addition of auxiliaries to present plant equipment is carried on by outside construction firms and engineers. With all due respect to this class of men, they cannot expect to be as familiar with plant operation and maintenance as the men who live with it from day to day.

Therefore what may appear to them to be a perfectly legitimate design or installation may with the help of a few gremlins, prove very

costly months later, when a quick maintenance job is required, and unbeknown to them, they have set up a situation for old "Bottleneck" to get in his dirty work. Just as an illustration let me quote an incident which was called to the writer's attention several months ago.

In installing a new transfer pump, the discharge line from the pump went from the pump in the basement of the plant to an overhead service storage tank in the upper part of the plant, with a static head of approximately twenty-five feet. A valve was installed in this discharge line at the outlet of the pump, no other provision being made to shut off the oil going to the service storage tank. One day during operation a piece of foreign material got into the line and worked its way up or down, until it became lodged in this particular valve, so that it could not be closed. The tank held several hundred gallons of fuel, and when the maintenance crew attempted to make repairs on the valve they were confronted with a problem of a flood of oil backing down on them from the tank above. A gremlin had gotten in its work and somebody had slipped up by not taking adequate precaution in laying out the piping system.

Such situations take place daily somewhere on some type of equipment or other. When planning and laying out new work it is always good practice to check and recheck your plans, keeping the thought in mind, that sometime or other you may have to make a hasty repair job on that equipment, and that you want it so designed and laid out, that no gremlin will step in and laugh at the predicament you may find yourself in, due to an oversight on your part in protecting yourself from a bad situation.

One of the biggest bottlenecks in many plants is found in piping arrangements of fuel, water or air lines. Whenever you find that it is necessary to add to or remodel such lines, three distinct things should be kept in mind, first simplicity of design, using adequate valves, checks and other fittings to do the job properly. Secondly flexibility in the design. Do not lay out your lines in such a manner that you create a "Bottleneck" which will not allow you to continue operating if certain parts of the equipment need maintenance, while operating.

Thirdly have ample capacity in your lines to care for the required amount of fuel, water or air needed.

This will take some study and thought all of which is good insurance on maintenance and operating work. Ofttimes jobs of this nature are taken on a cost-plus basis and whoever is installing the work will endeavor to get in as much equipment as he feels the "Freight will allow," without complaining. In so doing he creates a "bottleneck" by using too much and therefore violates the point of simplicity of design. This is one big point of argument against cost-plus work. Every piece of unnecessary equipment installed in a plant, or equipment which is unessential to good operation, means that much more maintenance. Reliability of equipment is necessary to be sure, but one's efforts can be overdone as well as underdone, if careful thought and study is not given to such matters of layout and design.

It is also a good policy to make a periodical check on equipment of a piping nature. Often one finds valves and checks, fittings and even piping, which from long periods of use have deteriorated to such an extent that they have either ceased to function properly as in the case of valves or check valves, or have become thin and corroded to a dangerous state such as in the case of fittings and piping.

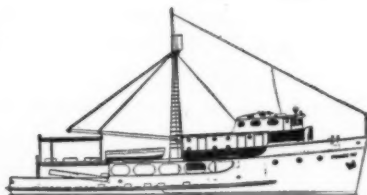
These periodical checkups show these weaknesses and good maintenance requires that changes should be made at the first opportune moment, in order that a complete breakdown and loss of time can be avoided. These are a few of the little gremlins which like to get in their work, hamper maintenance and give those in charge the proverbial headaches. To combat them inspection and prompt maintenance has proven to be a very effective weapon.

The gremlins that lie in wait around a defective tool or patched up piece of equipment are most deadly. Keep your maintenance tools inspected and throw out those which are likely to result in injury and lost time to those who use them. It is well to appoint one particular person and make him responsible for those tools and equipment vital to your maintenance work. Here again you can beat the gremlin.



LOOK Magazine

Saving time there . . . and back



It's a long haul for tuna—to Costa Rica and back!

So, when Otto Kiessig and Associates ordered two of the new-type, long range tuna clippers from the Consolidated Steel Corporation, they made sure the vessels would make the long run pronto.

These new all-steel, all-welded clippers, the Princess Pat, and Princess Anne, fishing for Sun Harbor Packing Company of San Diego, are being equipped with Sperry automatic steering.

These are the first ships of this general type to have Sperry Gyro-Compasses and Sperry Gyro-Pilots. As a result it

is expected that at least a day will be saved on each trip—a mighty important saving both to owners and crews, and to Uncle Sam, who needs every extra pound of fish the industry can produce.

With the Gyro-Compass to set an accurate course . . . and "Metal Mike" to steer that course automatically, the Princess Pat and Princess Anne will leave behind them straight-as-a-die wakes that mean double economy: Time saved . . . Fuel saved.

"Metal Mike" will also relieve the crew of much of the tedious work of fighting the wheel—a special advantage in rough weather. And to complete the picture, these new clippers also will be equipped with Sperry Electric Steering Engines, and remote control on each bridge wing for ease in maneuvering and docking.

The Princess Pat and Princess Anne exemplify the modern trend in fishing craft. When you order new ships, be



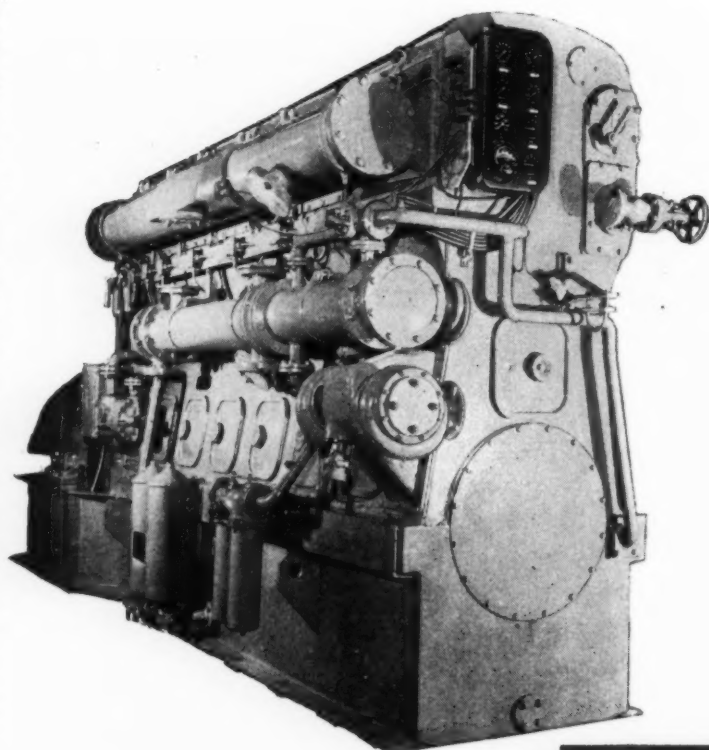
sure to specify the Sperry Gyro-Compass and Sperry Gyro-Pilot.

Sperry Gyroscope Company, Inc. GREAT NECK, N. Y.

Division of the Sperry Corporation

★
LOS ANGELES • SAN FRANCISCO • NEW ORLEANS
HONOLULU • CLEVELAND • SEATTLE

GYROSCOPICS • ELECTRONICS • RADAR • AUTOMATIC COMPUTATION • SERVO-MECHANISMS



**Used with Hendy
Auxiliaries . . .**

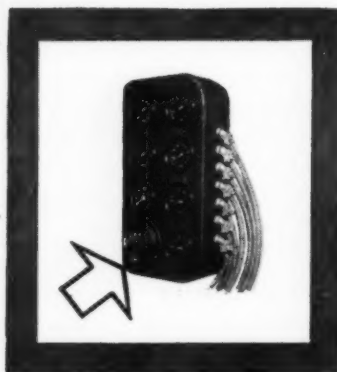
Alnor Exhaust Pyrometers

These 250 kw Diesel generator sets built by Joshua Hendy Iron Works are installed in pairs to provide auxiliary power for the new Maritime Commission Type C1-M-AV1 cargo ships. As in so many recent applications of Diesel power, you will find these Hendy engines equipped with Alnor Exhaust Pyrometers. Re-

liable exhaust temperature indications provide a dependable guide to uniform loading, correct adjustment, and consistently efficient operation. Alnor Pyrometers are built in a full range of single and multi-point types, to meet the needs of any engine. Write for special bulletin on exhaust pyrometers.

ILLINOIS TESTING LABORATORIES, INC.

420 North La Salle Street
Chicago 10, Illinois



Legal News—continued from page 74

The county official contended that he should not be compelled to testify as to the amount due the county because such disclosure would tend to his incrimination. The higher court refused to agree with this contention, saying:

"Our attention is not directed to any criminal statute which would visit upon appellant (official) criminal punishment or penalty. That it might involve moral turpitude or even fraud is not sufficient."

Supervising—continued from page 81

on emergency breakdowns to a minimum? The writer's suggestion would be to have a complete complement of all necessary spares on hand at all times.

Perhaps some will not agree that it is advisable to have several hundred dollars tied up in spare parts on shelves, or piled away in cupboards or corners, but the majority of supervisors and engineers who have experienced the difficulty of securing emergency repairs from plants now concentrating on war materials, will agree that with the present system of priorities, transportation facilities, and red tape required to obtain spare parts, no better insurance for quick repairs can be had, than to have the material on hand and ready for use. The days of securing repairs immediately from stock are over, at least for a few years.

Therefore a little foresight on the part of supervisors and engineers in carrying a full complement of repairs, not only insures quicker repairs, but it also helps the manufacturer to get out those parts without disrupting his war-time schedules on war production. It also gives the fellow dependent upon you for his power and light a feeling of security, in that he knows if some emergency breakdown does arise, he can be assured that repairs will be made in the shortest possible time and he can again be keeping up with his production schedule. It all sums up to one point, co-operation is a great asset in the handling of breakdowns.

1944 DIESEL PROGRESS Editorial Index

A COMPLETE index of all editorial material which appeared in the 1944 issues of DIESEL PROGRESS is now available. Included is a cross index of authors and articles. Feature articles are covered by title; news notes are for this index. Address requests to DIESEL indexed by names of manufacturers. No charge PROGRESS, 2 West 45th Street, New York 19, N. Y.

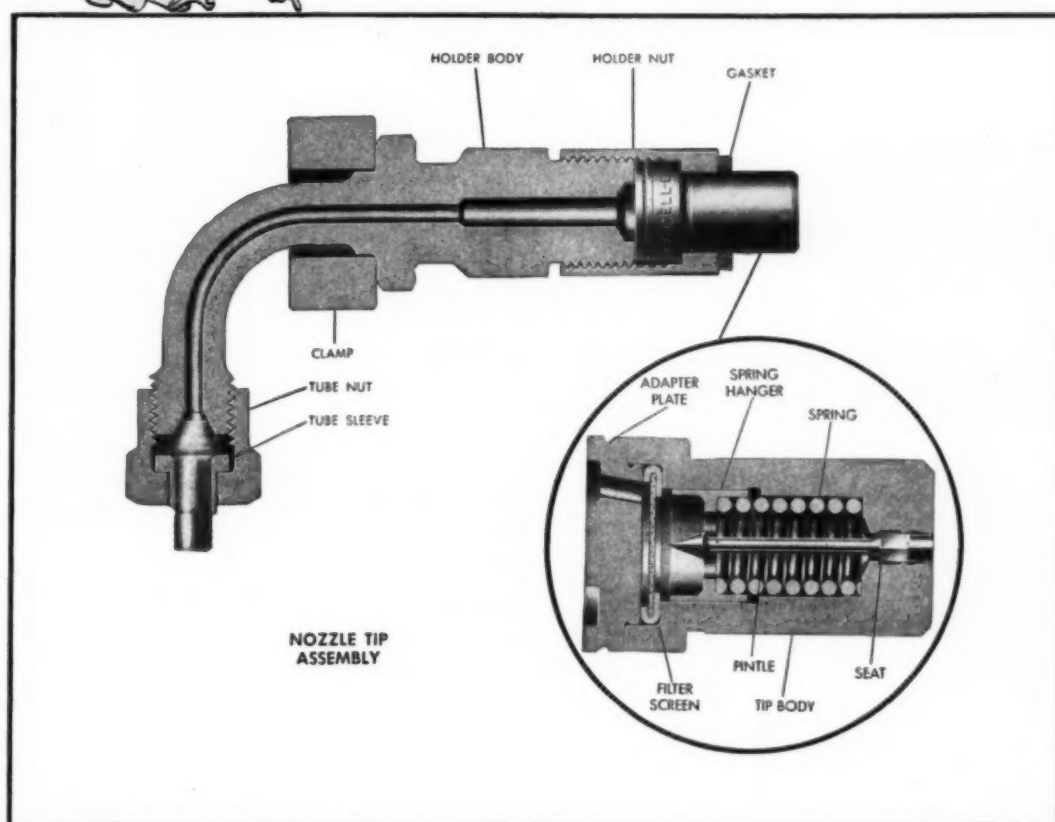
"Inside Facts" About the EX-CELL-O Nozzle

THIS IS THE INJECTION
NOZZLE FOR HIGH SPEED
DIESEL ENGINES



THE CROSS-SECTIONAL view below shows the simplicity of the EX-CELL-O Nozzle Tip Assembly especially designed for high speed Diesel engines. Actually there are only three working parts—pintle, spring and spring hanger, and because these parts are relatively light, they are particularly responsive at high engine speeds.

Since all of the working parts of the nozzle are contained in a simple, replaceable unit assembly which is calibrated and sealed at the factory, the nozzle is easily serviced in the field without the need for special test equipment.

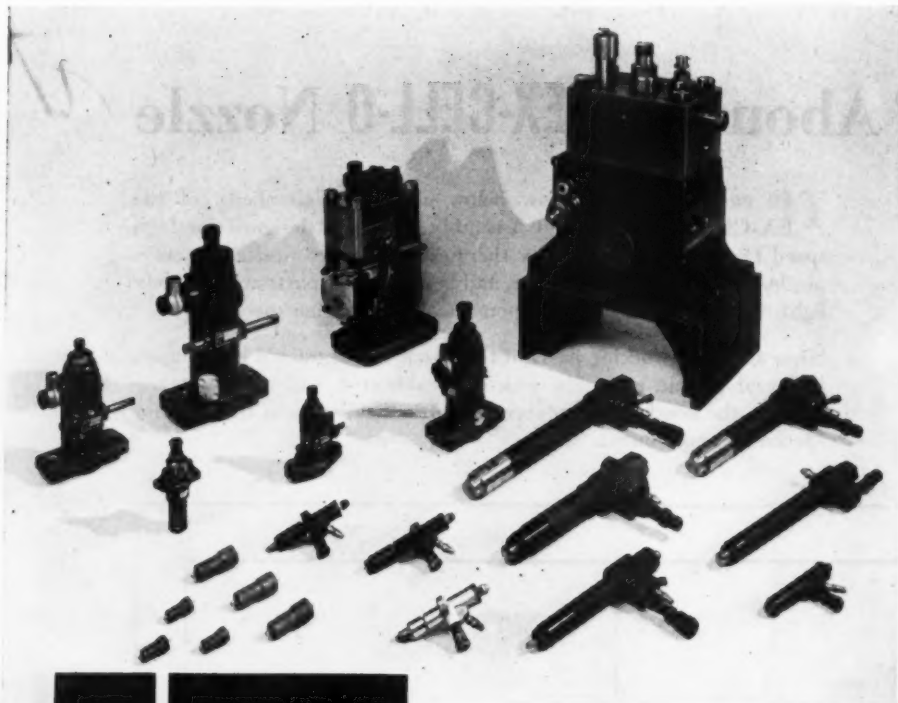


TWO TYPES of EX-CELL-O Fuel Injection Pumps are available for Diesel engines—Type KB with speed responsive timing and torque control for variable speed applications—Type KD for constant speed applications. EX-CELL-O pumps and nozzles can be supplied on engines through the engine manufacturers. For further description of this injection equipment, write today.

Fuel Injection Division
EX-CELL-O CORPORATION ★ ★ DETROIT 6, MICHIGAN

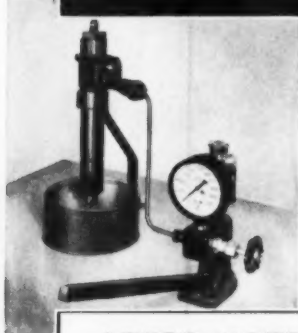
EX-CELL-O

EX-CELL-O for PRECISION



adeco...

YOUR SOURCE FOR DEPENDABLE FUEL INJECTION EQUIPMENT



ADECO NOZZLE TESTER For Low-Cost Maintenance

America's most widely used nozzle tester enables any mechanic to make quick, accurate tests on injector opening pressure, spray pattern, etc., and detect stuck needle valves and leakage around valve seats. Compact, portable, sturdy, precision-built. Pressures up to 10,000 p.s.i. Tests both large and small injectors on bench or engine. Prevents costly delays and possible damage to engine. Standard or Navy-approved gauge. Ideal for testing hydraulic equipment. Write for bulletin.

Whether you need standard fuel injection equipment or special units built to your specifications, Adeco offers the logical source of supply.

Today's line of Adeco equipment, the outgrowth of long experience in serving the Diesel industry, includes: Standard fuel injection pumps in plunger diameters from 7 mm. to 31 mm.; a complete line of standard nozzles and nozzle holders, including the water-cooled type; and the Adeco nozzle tester.

All Adeco products are built to highest standards, with years of trouble-free operation behind them to testify to their reliability.



AIRCRAFT & DIESEL EQUIPMENT CORP.
4401 NO. RAVENSWOOD AVE. • CHICAGO 40, ILLINOIS

Mattoon Joins Weatherhead

THE appointment of Charles S. Mattoon to the position of Industrial Relations Director of The Weatherhead Company is announced by A. J. Weatherhead, Jr., president.



Charles S. Mattoon

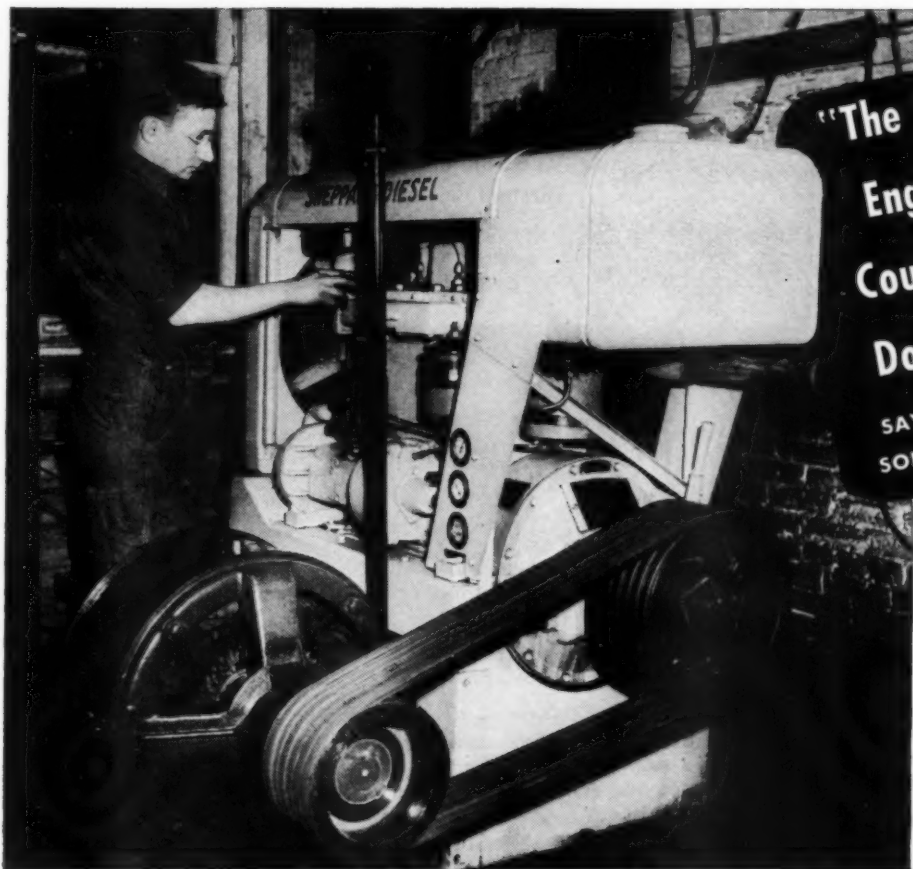
Mr. Mattoon comes from the Curtiss-Wright Corporation, Buffalo, where he directed industrial relations of the Airplane Division for eighteen of the twenty-nine years he spent with that company. In his new position, he will be executive director of personnel procedures and industrial relations for the entire Weatherhead organization of 4000 employees and four plants.

Worthington Advances George Steven

WORTHINGTON Pump and Machinery Corporation announces the appointment of George Steven to the post of Executive Engineer of its Buffalo Works. Harold W. Whiting, formerly Mr. Steven's assistant, now succeeds him as Chief Engineer of Buffalo Works Compressor Division.

New Brochure Emphasizes Conservation

DELUXE Products Corporation has issued a new brochure entitled, "So That Men May Know How To Make Oil and Engines Last Their Longest," in which the part played by oil filters in conservation of oil and engines is emphasized. The brochure shows that through its highly informative and extensive advertising, the company is rendering a technical service of prime importance, especially now when Victory itself depends on extending the life of vital lubricants and prime movers. This informative



**"The Simplest
Engine We
Could Find to
Do Our Job"**

**SAYS HENRY RIEHL &
SON OF PHILADELPHIA**



"POWER for the entire machine shop of Henry Riehl & Son of Philadelphia, Pennsylvania, is supplied by one Model #6 25-horsepower, Sheppard Diesel which was installed in June, 1941, and has been running nine hours a day, six days a week, ever since. The company manufactures narrow fabric textile machinery, working in both metal and wood. The various machine shops are housed in several adjoining buildings and on several floors, and contain both standard and special woodworking machines as well as a completely equipped machine shop. There is a total of eighty machines, the power for all of which is supplied by the Sheppard Diesel. (Note: The machines are never all in operation at the same time.) The Sheppard Diesel was chosen because, in the words of Theodore H.

Wagner, one of the partners in the firm, 'it was the simplest engine we could find that would do the work.' Moreover, their own employees are able to fix minor troubles when and if they arise, without the necessity of calling in experts for maintenance work.

"Dependability, cheapness of power, low maintenance cost and quick starting, with power available when needed and shut off when not needed, were the characteristics required by Henry Riehl & Son, and the Sheppard Diesel amply fills these requirements. No other engine was previously used for power, and commercial power could readily be bought, but at greatly increased cost. Figures are not available to demonstrate accurately the savings that have been realized, but Mr. Wagner states that 'the Sheppard

Diesel has paid for itself in the time we have had it.' When asked the opinion of the plant management concerning the performance of this engine, Mr. Wagner said, 'we think so much of it that we're going to order a larger unit.' He had particular praise for the efficiency and promptness of the Service Department of R. H. Sheppard Company.

"Last December the engine was overhauled, after three and a half years of service, and is now in new working condition. Apart from this overhaul, there has been no major expense for maintenance or repair."

Your priority may entitle you to a Diesel right now. Do as Riehl did—specify Sheppard and let the Diesel pay for itself. Write today for free bulletins and advice about obtaining WPB approval.

POWER UNITS; 8 TO 50 HP • GENERATING SETS; 3 TO 30 KW

Sheppard
ALL AMERICAN DIESEL
POWER UNITS

R. H. SHEPPARD COMPANY

1116 Middle St., Hanover, Pa.

Please send me free literature describing
Sheppard Diesel Power Units.

Name

Firm Name

Address

brochure is available on request to DeLuxe Products Corporation, 1407 Lake Street, La Porte, Indiana.

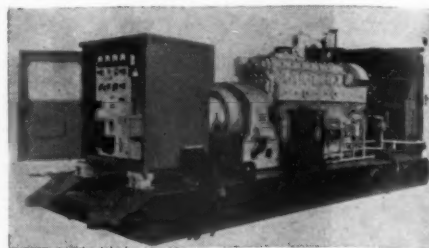
Portable Diesel Generating Units For Devastated Cities

ORDERS for a large number of portable Diesel generator sets have been received by the Cleveland Diesel Engine Division of General Motors for use by U. S. Army Engineers in supplying power to war devastated cities. The units are mounted on skids making them easily movable

and they can be transported on truck, by rail or towed along the ground.

The announcement made by George W. Codrington, General Motors vice president in charge of this division, did not disclose the exact number of units ordered by the Army but it was intimated that the contract was one of the largest ever placed for this type of power-producing units. Although only two different sized engines are called for it is possible to hook up three different sized generators. On

the larger 12-cylinder engine a 418 kw. generator is used while on the 8-cylinder engine generators of 248 kw. and 167 kw. are being put in service.



Self-contained portable Diesel generating plant produced by General Motors Cleveland Diesel Division.

The application of Diesels to this use was developed by this division, according to Codrington, in conjunction with Army engineers and the most important factor in its acceptability by the armed forces was its mobility and the economy with which it can be operated. The durability of the product has long been known to the armed forces, the executive said, and its proving ground has been the toughest kind of assignments. Included in the jobs for which these 2-cycle Diesel engines have been used are more than forty types of Government vessels, both for propulsion and auxiliary power, including main propulsion for ships up to 16,000 tons.

This new application of Diesel power, Mr. Codrington said, will also provide many new peacetime outlets in fields where the lack of portable power has proved a deterrent to production. It is quite possible to utilize this equipment in oil fields, mining operations of all types, agriculture and many other types of industries which do not have power line service. Coincident with this announcement, Mr. Codrington also made it known that his division had turned out more than 10,000,000 hp. in engines ranging in size from 150 horsepower to 2,000 horsepower.

Rockford Drilling Changes Name

THE name of Rockford Drilling Machine Division of Borg-Warner Corporation, at Rockford, Ill., has been changed to Rockford Clutch Division, it was recently made known by the corporation. With three factories in war production, and a corresponding increase in its engineering activities, the division has acquired the Borg-Warner research laboratory at Rockford and will operate it as the Rockford Clutch Engineering Laboratory, it was announced.

Rockford Drilling Machine Co. has been a

ROSS

"CP"
COOLERS

A STANDARD COOLER REALLY ADAPTABLE TO INDIVIDUAL CONDITIONS

CHOICE OF HEADS
TO SUIT FOULING
TENDENCY OF
FLUIDS

BAFFLE SPACING
DETERMINED BY
FLOW RATES

VENTS, DRAINS,
NOZZLES AND SUP-
PORTS IN ANY
LOCATION

The cooler you select must not only fulfill your performance needs to the maximum, but should not require elaborate changes in your piping layout. That's an average assignment for a Ross "CP" Cooler. There is such a variety of standard, mass produced parts, that selection is possible for every individual need. Final assembly is, therefore, very much a tailored job.

More specific facts in
BULLETIN 5322.
Available promptly.

ROSS HEATER & MFG. CO., INC.

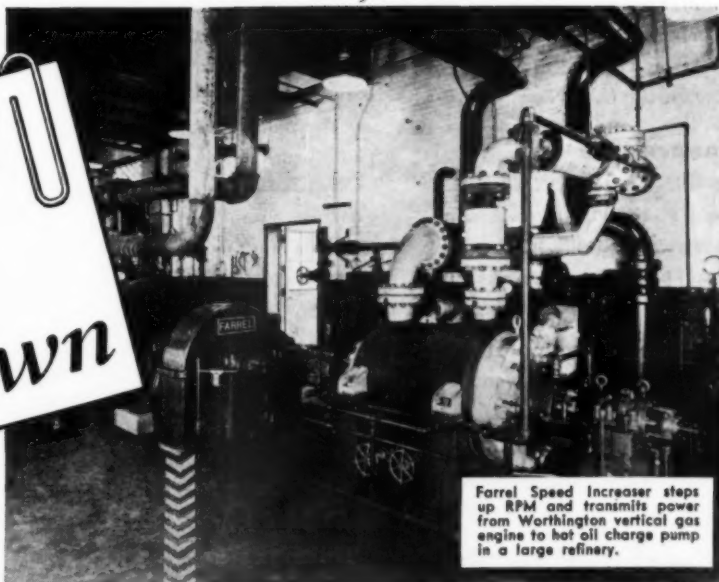
DIVISION OF AMERICAN RADIATOR & STANDARD SERVICE CORPORATION

1425 WEST AVENUE
BUFFALO 13, N. Y.

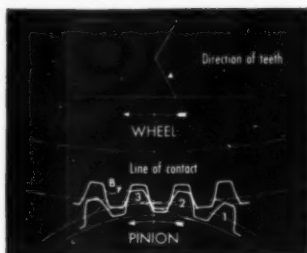
Protected Against Breakdown

by

RIGHT DESIGN AND PRECISION MANUFACTURE

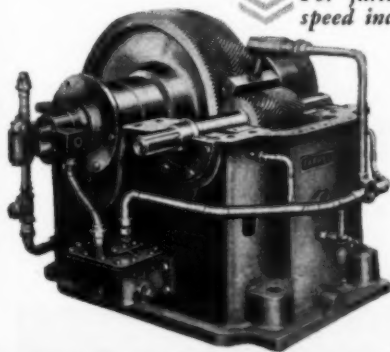


Farrel Speed Increaser steps up RPM and transmits power from Worthington vertical gas engine to hot oil charge pump in a large refinery.



The lines of contact are oblique across the face of the teeth, and the pressure is evenly distributed over each tooth from tip to working depth line, so there is no tendency for the teeth to wear unevenly.

Farrel speed increasing units are available in a standard series of 47 sizes, with speed ratios ranging from 1 1/4:1 to 12:1. If higher ratios are required, units using two sets of gears can be supplied with a ratio range from 12:1 to 40:1.



In the vital pumping jobs in refinery and pipe line service—wherever non-stop performance is a must—the proved design and precision workmanship of Farrel Speed Increasers insure long trouble-free service.

The gears are of the famous, continuous tooth, *Gear With A Backbone* design, precision generated by the Farrel-Sykes process. The *Backbone* of the gears, formed by the helices being joined without a center groove, provides greater strength and load-carrying capacity in small space.

Oversize shafts provide extra rigidity to guard against torsional deflections under peak torque variations. Shafts are ground to close tolerances and correctly mounted in precision finished bearings. Original alignment of moving parts is accurately maintained by the rigid, double-walled housing.

Spray lubrication at the mesh line of the gears, and pressure lubrication for all bearings are provided by a self-contained, circulating oil system—another factor contributing to long, efficient unit life.

For further information on Farrel SI units for speed increasing or high speed reducing applications, write for catalog No. 438.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONN. BUFFALO, N. Y.

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Pittsburgh, Akron, Los Angeles

OIL FIELD REPRESENTATIVES

Hercules-Lupfer Engine Sales Co.
124 N. Boston St., Tulsa, Okla.
V. W. Osborne
2815 University Blvd., Houston 5, Texas

Farrel-Birmingham

division of Borg-Warner since 1929 and is the outgrowth of a company incorporated on Oct. 24, 1899. For months after Pearl Harbor it was the sole supplier of medium tank clutches for the U. S. Army. At present, the division also is building clutches for the U. S. Navy.

New Maintenance Digest

RECENTLY published is a new, informative "Digest on Modern Power Plant Procedures." Its 20 pages give many worthwhile tips on up-to-the-minute techniques and materials for

handling cleaning, degreasing, descaling, derusting, paint stripping and other commonly recurring power plant maintenance tasks . . . it points the way to valuable man-hour savings . . . fewer and shorter equipment shut-down periods . . . more and better service from present equipment. Among the 71 different power plant maintenance operations which are concisely described are cleaning and descaling heat exchange equipment and cooling systems; boiler room equipment; salvaging fittings, valves, pumps, etc.; stripping paint, varnish from

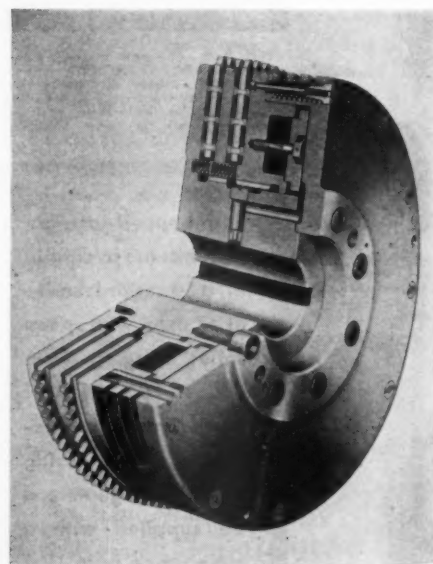
motor housings, armature coils, radiators, transformers, gas meters, etc., prior to inspection, repair, overhaul or repainting. Published by Oakite Products, Inc., 22D Thames Street, New York 6, N. Y., copies are available free upon request.

1944 DIESEL PROGRESS Editorial Index

A COMPLETE index of all editorial material which appeared in the 1944 issues of DIESEL PROGRESS is now available. Included is a cross index of authors and articles. Feature articles are covered by title; news notes are indexed by names of manufacturers. No charge for this index. Address requests to DIESEL PROGRESS, 2 West 45th Street, New York 19, N. Y.

Booklet Describes New Air-Actuated Twin Disc Clutch

THE Twin Disc Clutch Company describes its new air-actuated clutch, ideal for remote control set-ups and where "feather-touch" engagements in heavy-duty operations are necessary, in a new, eight-page engineering bulletin, No. 139. The new clutch is known as the Twin Disc Model P Air-Actuated Clutch. It retains many of the features of the familiar heavy-duty Twin Disc Model E (friction) Clutch and may be used in many of the same types of installations as the latter clutch.



Cutaway view of new Twin Disc Air-Actuated Clutch

The air-actuated clutch operates by remote control without a complicated linkage system and shaft space is greatly reduced. It has ideal operating characteristics because any amount of air pressure—within limits—can be applied to the friction plates to provide either slow or fast



Finish grinding microscopic drills requires the light touch of highly trained operators working under powerful binoculars.

Yes, we will drill your Diesel fuel injection nozzles for you *exactly* to specification, as we are doing for many Diesel engine manufacturers. Or we will supply you microscopic, long-lived precision drills with super-sensitive drilling equipment, backed by skillful engineering service. Consult with us on your small precision drilling and machinery problems.

The Only Business Of This Kind In the World

National Jet Company

115 MILTON PLACE

CUMBERLAND

MARYLAND

A-C VOLTMETER

DIRECT-CONNECTED
EXCITER

DRIP-PROOF
PROTECTED
CONSTRUCTION

TERMINAL BOX

"SYNCHROSTAT"*
VOLTAGE REGULATOR

A-C AMMETER

RHEOSTAT FOR
EXCITER FIELD

"POLAIRE"
VENTILATION

**THE LOW-COST, EASILY
INSTALLED SOURCE OF
DEPENDABLE A-C POWER**

**18.7 to 187 KVA
Two-Bearing, and
Single-Bearing Types**

E-M "PACKAGED" GENERATORS

Here's high quality a-c voltage in power units as trim, compact and ready-to-go as you could wish . . . the new E-M "Packaged" Generators. Designed by E-M engineers, who originated and developed America's first "packaged" generator, these improved units offer the best in modern, functional design and performance. Here are typical money-saving advantages:

Single, compact unit. Generator, exciter, voltage regulator and meters are all in a compact unit. Factory-wired and tested.

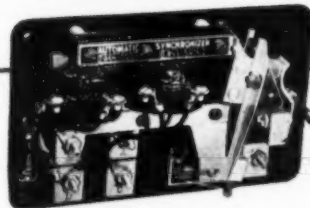
Easy to install. Generator is ready to operate as soon as connected to power supply. Just couple or belt to driving engine.

Only 3-wire connections. You run only 3 wires (for 3 phase) to load through generator line switch. No complicated switchboard.

Automatic voltage control. An E-M "Synchrostat" automatically holds voltage within 2% of nameplate rating. Keeps lights and motors operating at their best with high quality voltage. Minimizes voltage dips.

Will start big motors. E-M "Packaged" Generators will start large motors up to $1\frac{1}{4}$ hp per kw of generator capacity.

WRITE TODAY for Condensed Price List and Data Sheet 2100-119.



**"It Puts Two or More Generators
on the Line . . . AUTOMATICALLY!"**

The E-M Automatic Synchronizer (shown with cover removed) closes magnetic line switch when generator is up to speed, making it easy to parallel incoming generator with one already in operation.

- REQUIRES NO EXPERIENCE. Push-button control.
- SAFE, CORRECT SYNCHRONIZING IS ASSURED.
- SYNCHRONIZES PROMPTLY.

Engineering and Sales Offices in 52 Cities

**GOOD
POWER PLANTS
DESERVE**

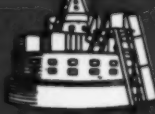
GENERATORS

ELECTRIC MACHINERY MANUFACTURING COMPANY

Minneapolis 13, Minnesota



SPECIALISTS
IN SYNCHRONOUS
GENERATORS
SINCE 1903



A-2011

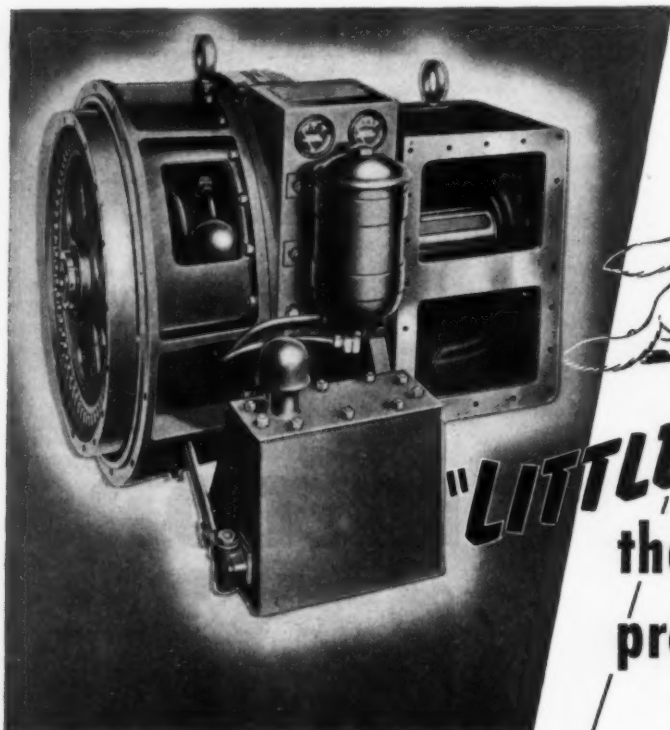
*REG. U.S. PAT. OFF.

engagement. Few moving parts are employed to assure easy maintenance. Copies of Bulletin No. 139 may be obtained by writing the Twin Disc Clutch Company, Racine, Wisconsin.

New Unit In Cleaning and Degreasing Efficient

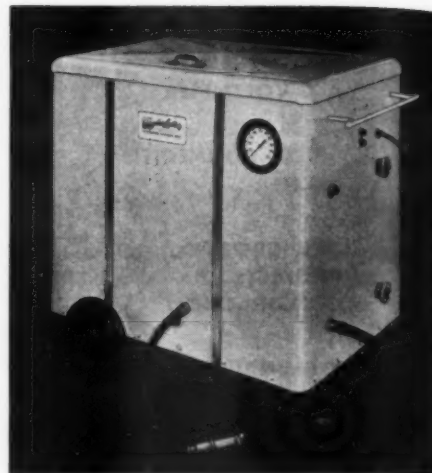
CLEANING and maintenance of Diesel engines and equipment in both land and marine service is an easier, faster and much more satisfactory job as the result of the development of

the Hydra Letric Hy-Pressure Cleaning and Degreasing Unit. This efficient, portable unit needs only a water connection, either hot or cold, and power for the motor, to enable the operator to rapidly clean up the most difficult grease-and-dirt encrusted equipment. Around the shipyard it is used in cleaning bilges, grease lines, flushing down decks and superstructure, cleaning motors, and in maintenance cleaning of every kind. In Diesel locomotive maintenance shops and truck fleet garages it speeds the cleaning job and cuts cleaning costs.



"LITTLE FOXES"
that rob
production

Some of the idle moments . . . the "little foxes" that rob production of its maximum attainable high record for total work done . . . can be eliminated with a Twin Disc Torque Converter (Lysholm-Smith Type). For example: the idle moments due to the "bobbing" of the load, which commonly result from brake application, are avoided. By merely throttling his engine, the crane operator holds his load motionless in mid-air or eases it gently and accurately up or down. There's no "bobbing" . . . no jerks on the cables. The result is more work done in a given unit of time . . . less work for the operator. **TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).**



Hydra Letric Degreasing Unit

This method of cleaning provides the three essentials for fast and thorough cleaning:—a grease emulsifying chemical solution of uniformly controlled strength; ample volume of water to rapidly flush away the loosened dirt; and high pressure to increase flushing action and to drive cleaning solution into every crevice where dirt may collect.

For unusually heavy grease accumulation, dirt-encrusted and carbonized surfaces the Hydra Letric Unit is designed to apply a pre-soak solvent oil which quickly loosens up the toughest, hard-packed layer of grease and dirt preparatory to hy-pressure cleaning.

Design and Operation

The machine is simple in operation, and sturdily built to give long service life under all operating conditions. It consists of two tanks, a 24-gallon tank containing the cleaning chemical in concentrated solution, and a 34-gallon pre-soak solution tank. Hydra Letric Cleaning Compounds contain nothing that will corrode or clog pump and other parts of Hydra Letric Unit and they are non-injurious to lacquer finishes, metal trim, or rubber. For full particulars write Hydra Letric Products Corporation, 215 North Senate Street, Indianapolis, Indiana.

Briggs Clarifier Appoints Western Distributors

THE Briggs Clarifier Company, Washington, D. C., announces expansion of its sales activities in the states of Colorado, Nebraska, New Mexico, Oklahoma, Oregon, Texas, Washington and Wyoming. The Manning Packing and Supply Company (formerly the Frank Groves Company), Portland, Oregon, has been selected to handle distribution of Briggs Oil Clarifiers in Oregon and the southern parts of Washington. The Hendrie and Bolthoff Manufacturing and Supply Company, Denver, Colorado, has been



TO MARK PROGRESS



FACILITIES AND EXPERIENCE

*To Produce Drop Forgings
Up to 2500 Pounds*

New techniques plus experience and specialized manufacturing facilities produce unusual-shaped drop forgings up to 2500 pounds. Greater strength and economy in vital parts by use of drop forgings provide engineers wider latitude in product design.

Ladish engineers are available for consultation on your products.



LADISH DROP FORGE CO.

CUDAHY • WISCONSIN
MILWAUKEE SUBURB

appointed to handle distribution in the states of Wyoming, Colorado, New Mexico and western Nebraska. Distribution in the state of Oklahoma will be handled by M. F. Hampton Company, Tulsa, Oklahoma. In northern Texas Briggs products will be distributed by the Hoffman Supply Company, Abilene, Texas.

Federal Mogul Makes Executive Changes

H. GRAY MUZZY, president, Federal-Mogul

Corporation, announces the election of Guy S. Peppiatt as executive vice-president in charge of manufacturing and related activities. Associated with Federal-Mogul for 18 years, more recently as controller and executive assistant to the president, Mr. Peppiatt's most immediate concern in his new post will be with co-ordinating manufacturing activities of Federal-Mogul plants in Detroit and Greenville, Michigan, Mooresville, Indiana, and Fresno and San Francisco, California. Samuel E. MacArthur has

been appointed controller. William R. V. dell, manager of the Federal-Mogul Service Division, was also made assistant secretary of corporation at the same board meeting.

New Rust Preventive Bulletin

NEW, war-developed rust preventives and application for reduction of rust losses in industry are discussed in "The Service Factor" issued by Sinclair Refining Company.

The presentation gives information about proper type of rust preventive and method of application for protection of external surfaces of machinery, internal surfaces, bearings, other moving parts, engines, and automotive vehicles. The treatment covers idle machinery and equipment in storage and in transit.

Preliminary treatment necessary before application of rust preventives is outlined. A chart identifies the various rust preventives with Government specification number preventives. Copies may be obtained without charge upon request to "Service Factor" Sinclair Refining Company, 630 Fifth Ave., New York 20, N. Y.

J. H. Patterson Named Manager of Cummins Diesel Export Corp.

J. H. Patterson has been appointed manager of the Cummins Diesel Export Corporation, subsidiary of the Cummins Engine Company, Inc., Columbus, Indiana. Offices of the Export Corporation are located at 6303 Chrysler Building, New York 17, N. Y.



J. H. Patterson

Mr. Patterson has specialized in the development of service and sales organizations for the past 20 years. Prior to his appointment as Cummins Export Manager, he was Division Manager of the National Refining Company.

EVEN THE VIBRATION FROM THE WHISTLE CAN BE STOPPED... by KORFUND



Can you imagine structure-borne vibration from a ship's whistle causing actual damage? Sounds silly, but it actually happened!

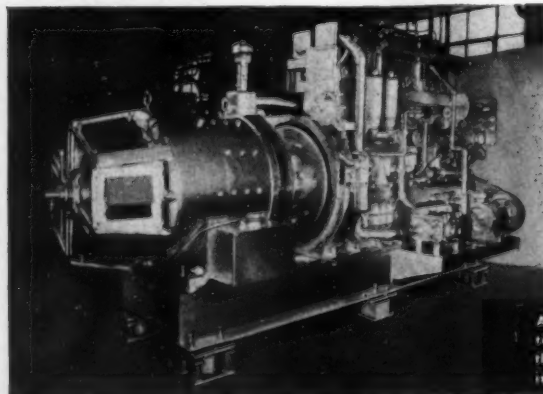
While the function of a whistle is to create vibration in the form of sound waves, in this case, an excess of vibration was carried down the steel stack and into the radio shack within its base. The disturbance was so severe that connecting jacks were loosened sufficiently to break contact.

Korfund engineers provided the solution to the problem. The disturbing frequencies were eliminated

completely... and permanently... when Korfund steel-spring isolators were installed under the whistle.

But this is an unusual case of vibration control. Where Korfund anti-vibration engineering is most often found serving the marine industry is in the prevention of vibration transmission from Diesel generating sets. Korfund has successfully isolated thousands of such sets in a wide variety of vessels.

Don't wait for vibration to become a problem. Write for descriptive literature which will show what Korfund Vibration Control can do for you.

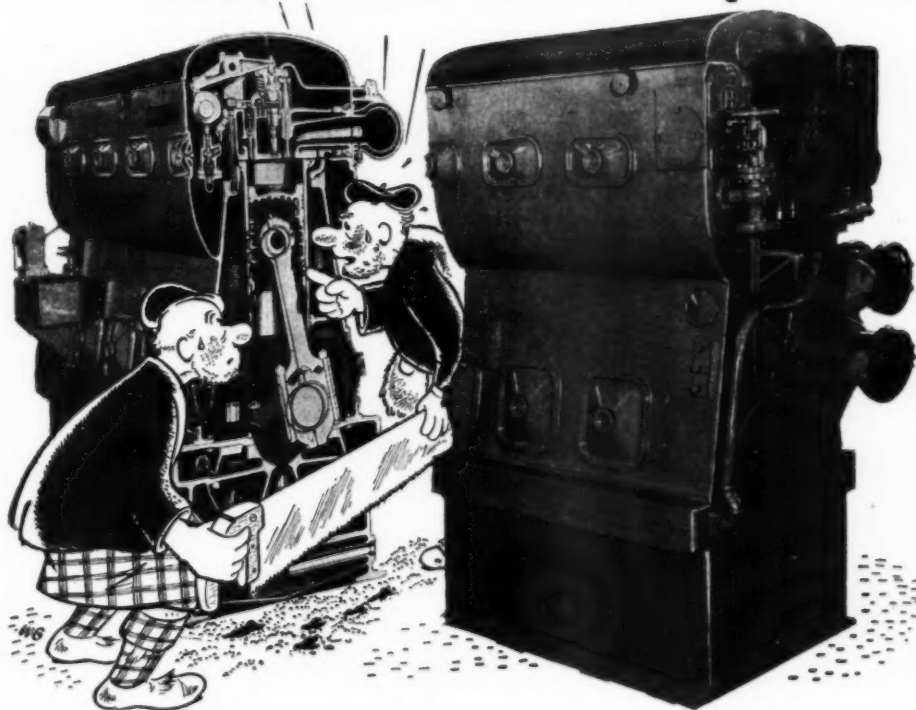


THE KORFUND COMPANY, INC.
48-28 Thirty-second Place
Long Island City 1, N. Y.
Representatives in Principal Cities



Almost all types of vessels use Korfund Vibration Control. This Diesel-generator set, built for the Navy, is mounted on Korfund steel-spring isolators.

*"They'r-re richt, McDuffie,
it **HAS** oil-cooled pistons!"*



"... that's another-r-r reason this Diesel's sa thrifty." Oil cooling of pistons, McDuffie, reduces wear on rings and liners...lowers oil consumption...helps keep maintenance costs down.

Series 50 Diesels have advantages never before combined in a single design.

Besides oil-cooled pistons, they have overhead camshafts, unit pumps and fuel injectors, full pressure lubrication, and many other features. Now, for the first time, you can have the benefit of *all* these features in *one* tested and reliable Diesel. For a complete description, clip and mail the coupon today.

Joshua Hendy Iron Works,
Sunnyvale, California.

Send for NEW Diesel Booklet—No Obligation

JOSHUA HENDY IRON WORKS
SUNNYVALE, CALIFORNIA

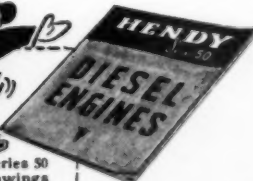
Mail me your new booklet that completely describes the Series 50 Diesel, with photographs and cross-section cutaway drawings showing the design of all parts.

Name _____ Position _____

Company or business _____

Address _____

I am interested in Marine ☐ Stationary ☐ models and in
hp ranges from 190-250 ☐ from 250 up ☐



89-9-10

**Walter Kidde & Company, Inc.
Acquires Youngstown Miller
Company, Inc.**

WALTER Kidde & Company, Inc., announce that as of January 10, 1945 they have purchased the capital stock of the Youngstown Miller Company, Inc., formerly of Sandusky, O. Orders on hand will continue to be filled under the direction of F. L. Gerin, who becomes Vice President and General Manager. Other officers of the new subsidiary of Walter Kidde & Com-

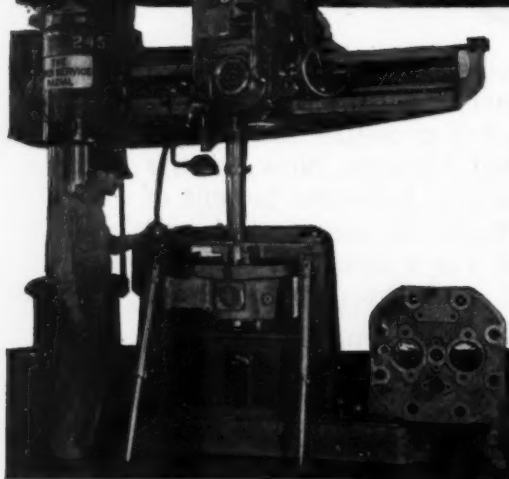
pany, Inc. will be John F. Kidde, President, Harold A. Carter, Vice President, G. Crosby Hiss, Secretary and William Deyerberg, Treasurer and Comptroller. R. E. Strobel will continue as Sales Manager for the Youngstown Miller products.

Sale of Youngstown Miller products will continue through selected distributors and representatives of the parent company. The main office of The Youngstown Miller Company will be located at 675 Main Street, Belleville, N. J.

**New Heat Recovery
Silencer for Diesels**

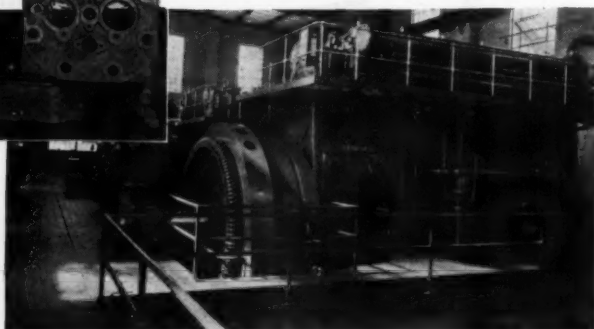
CONTINUED improvement in heat recovery devices is a matter that is being followed with considerable interest by everyone concerned with power plant operation where steam or hot water is in demand. The latest to come to our attention is the new Vortex Heat Recovery Silencer for Diesel engines developed by the Engineering Specialties Co., Inc., which appears to be a highly efficient unit.

INTERCHANGEABILITY



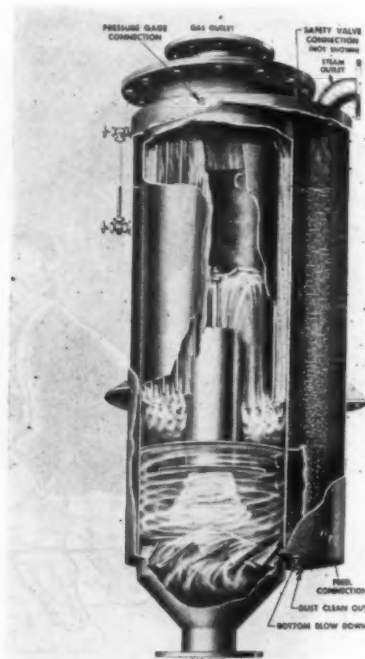
Long ago, we here at Fulton, recognized the meaning of interchangeability of parts and we tooled our production of Fulton Diesels to give our users this outstanding maintenance economy. Jigs and fixtures are applied to every possible machining operation to produce uniform parts, an exceptionally well co-ordinated engine and to permit replacement with the minimum of time and expense. That is another reason why Fulton Diesels all over the country are turning in remarkably low operating and maintenance cost records.

1852 Successful Engine Builders For 93 Years 1945



Top: Large base plate of Fulton model BCS Diesel with drilling jig clamped in place. Above: View showing fixture for machining Model BCS cylinder heads. Right: Four large Fulton Diesels installed in the Algona, Iowa, municipal power plant.

FULTON IRON WORKS CO.
• ST. LOUIS • MISSOURI •



Cutaway view of the Vortex Heat Recovery Exhaust Silencer.

Designed for both marine and stationary installations, the new Vortex Heat Recovery Silencer combines four functions in one construction: steam generation up to 30 lb. p.s.i. depending upon the service, hot water heating, exhaust silencing and the removal of sparks and carbon from exhaust gases. Yet, according to the Engineering Specialties Co., Inc., it normally occupies little more space than spark arrester-silencers without the steam or hot water features.

"As a steam generator, it produces an exceptionally high ratio of steaming rate to engine horsepower due to its exclusive design and unique construction which holds the rate consistently high for most operating conditions," says one of the company's engineers.

The rate at which steam and hot water are produced is unusual in that the rate does not fall off due to carbon deposits on heating surfaces. In the case of the Vortex Heat Recovery

Cracks In Heads or Pistons Bothering You?

Here's how to repair them quickly, easily, inexpensively

... By using the HARMAN "Save-a-Weld" Process

<p>HARMAN SAVE-A-WELD MATERIAL</p> <p>CHAIN-LOCK TOP VIEW BEFORE EXPANDING SIDE VIEW BEFORE EXPANDING SIDE VIEW AFTER EXPANDING</p> <p>SEAL-PACK TOP, SIDE AND EXPANDED VIEWS</p>			
<p>These are the Harman "Save-a-Weld" Materials. Chain-Locks and Seal-Packs are all you have to buy to make "Save-a-Weld" Repairs.</p>	<p>Locate extent of crack and mark the ends. If crack goes over shoulder, continue repair on other plane.</p>	<p>Divide length of crack by length of Chain-Lock and mark off lock locations across the crack.</p>	<p>Trace one side of Chain-Lock and move the lock one position to locate centers for drilling design.</p>
<p>Drill design at the end of crack to receive first of series of locks.</p>	<p>Complete drilling details in "Save-a-Weld" Instruction Book. Any mechanic with ordinary tools can make these repairs.</p>	<p>Insert and upset locks one at a time until design is filled. Follow simple instructions to make perfect repairs.</p>	<p>Having locked one end of crack, find centers at the other end of crack, drill design and fill with locks.</p>
<p>Repeat process at each design location (see Fig. 3). This will keep crack from extending and will return up to 85% of the strength of casting.</p>	<p>Then seal the crack by drilling holes, one at a time along crack between lock groups until entire length of crack has been drilled and filled.</p>	<p>Detail of installation of overlapping and interlocking Seal-Packs being upset in position in holes between lock groups.</p>	<p>Enlarged top view of part of restored head with crack completely repaired. Head is thus quickly and inexpensively gotten back to work.</p>

For complete detailed information on just how to make "Save-a-Weld" repairs with your own crews right on the job, write for free Harman Instruction Book. Any good mechanic, by following these simple, complete instructions can make patented "Save-a-Weld" Process repairs on fractured iron castings, saving you time and money.

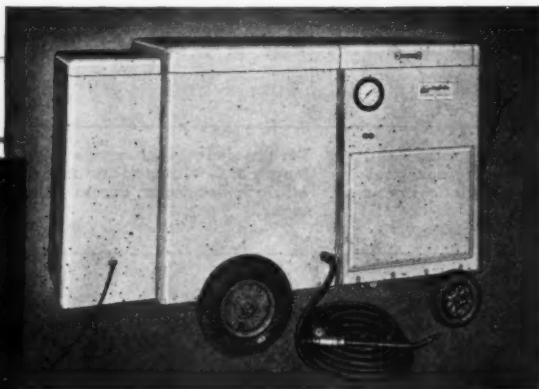
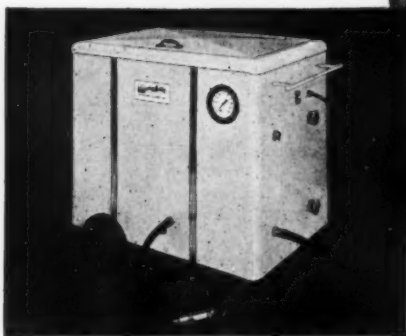
HARMAN PROCESS CO.
401 Montana St. EL PASO, TEXAS



Silencer, most of the soot and carbon is removed by the spark arrester before they reach the heating surfaces. Piping from the heat recovery silencer can be so arranged that the unit can be used for steam or hot water as conditions require. Spark arresting and silencing qualities are the equal of other Vortex exhaust units designed expressly for these purposes.

Owners and operators of Diesel engines will find many uses for this waste heat silencer. The steam can be used for space heating, processing

and other services. And the unit is equally useful when functioning as a hot water boiler. Furthermore, in many instances it will serve as an auxiliary to separately-fired steam generators and hot water boilers or as an adjunct to carry peak loads. In other situations, where Diesel engine users have only intermittent need for steam or hot water, the Vortex Heat Recovery Silencer can be operated dry or partially filled without risk or damage. For full particulars write Engineering Specialties Co., Inc., 39 Cortland St., New York 7, N. Y.



ABOVE—Hydra Letric Unit with integral oil-fired water heater delivering 5 g.p.m. at 100° F. rise.

LEFT—Hydra Letric Unit designed for service where hot water or steam is available.

EMULSIFY THE GREASE ...FLUSH THE DIRT AWAY

● The Hydra Letric method of cleaning with a hot chemical solution at high pressure in large volume sets a new standard of maintenance cleaning efficiency in shipyards, truck-fleet and locomotive repair shops.

Heavy accumulations of grease and dirt are rapidly removed by the fast-acting water-

borne emulsifying compound under 300 lbs. pressure at 5 gallons per minute. The chemical solution cuts the grease, the large volume of water quickly flushes away the loosened dirt, and the high pressure increases flushing action and drives the cleaning solution into every crevice where dirt may collect.

Around the shipyard the Hydra Letric Unit cleans bilges, grease lines, decks and superstructures, engines. In diesel locomotive shops and truck fleet garages it improves every cleaning and degreasing job and cuts cleaning time and costs.

The Hydra Letric Cleaning and Degreasing Unit is simple in operation and sturdily built for heavy duty and long service-life under the most difficult operating conditions.

Write for complete specifications,
operating data and prices.

HYDRA LECTRIC PRODUCTS CO.
213 North Senate Avenue, Indianapolis 2, Indiana

HydraLetric
HY-PRESSURE
CLEANING AND DEGREASING UNIT

Hydra Letric Cleaning Compounds
FERRO-KLEEN—A powerful degreaser that quickly loosens dirt on ferrous metals.
ALLO-KLEEN—An active compound non-corrosive to all non-ferrous production metals.
These compounds contain no caustic (NaOH) (KOH), soap, acid or abrasive—100% soluble. Safe on lacquer, paint, rubber.
SOLVO-KLEEN—Liquid solvent pre-soak for softening hard-packed accumulations. Non-corrosive to light alloys, containing no caustic or cresylic acid.
Hydra Letric Compounds do not corrode or clog pump or other parts of the cleaning machine, and do not leave a precipitate on cleaned surfaces.

The Hydra Letric technique of cleaning with a water-borne compound at high pressure and large volume has proved superior to steam and other cleaning methods in military, naval and war production service.

Airline Pilot Turns Advertiser

WILLIAM W. MARTIN has been named assistant to the Director of Advertising of the Aireon Manufacturing Corporation according to John B. Walker, Vice-President. Prior to his affiliation with Aireon, Martin was an airline pilot with the Transcontinental and Western Air, Inc. and Mid-Continent Airlines.



William W. Martin

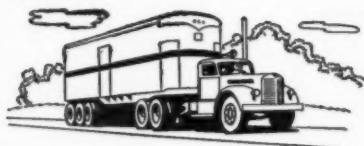
His journalistic career began at the University of Nebraska where he majored in journalism and worked for the Lincoln State Journal as a reporter. His interest in aviation interrupted a newspaper career with the Kansas City Star but has returned to the closely allied field of advertising. He will prepare material on power controls, radio communications, and propeller governor test units because of his familiarity in use and practice in ground work and while flying airline equipment.

"Diesel Vessels"—an excerpt from Charlie Weaver's Summary of Westinghouse contributions to the maritime program in 1944

DIESEL driven vessels were also prominent in 1944's ship construction program and Westinghouse last year shipped one quarter million horsepower in gearing for Diesel propulsion systems. The gears, built at the company's Nuttall Works, ranged in size from 500 hp. units for Army cargo ships to the much larger units for Navy submarines. Patrol craft, minesweepers, net tenders and fishing boats were also equipped with Diesel gears.

Diesel-electric drive was also produced in considerable quantity in 1944, with the new "Wind" class Coast Guard ice breakers perhaps the most interesting application. Six 1375 kw

"CRANKSHAFT WEAR VIRTUALLY VANISHED WITH TOCCO- HARDENING"



DIAMOND T REPORTS:

"WEAR of TOCCO-hardened crankshafts frequently is not enough for the average shop to measure even after mileages of 100,000 to 200,000 or more."

This service is typical for crankshafts and camshafts surface-hardened by the TOCCO Process of Electrical Induction. Records show that these parts last 5 to 10 times longer than shafts which are *not* surface-hardened.

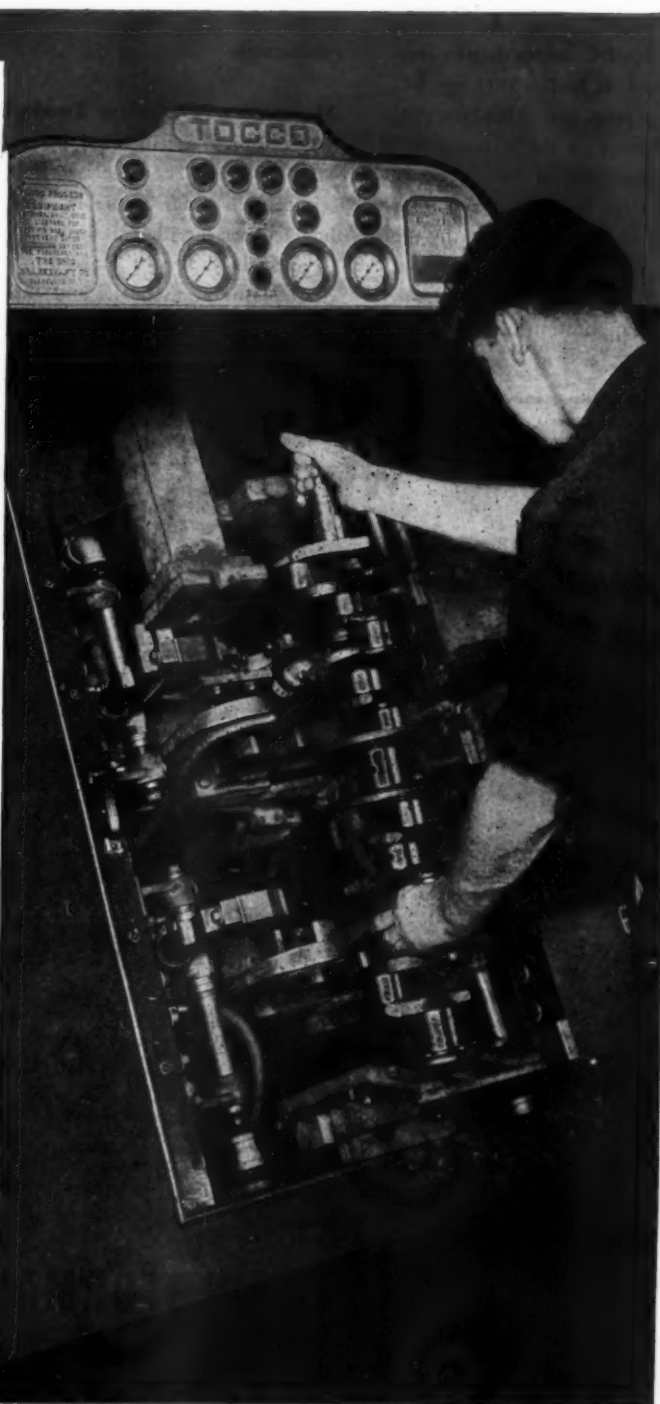
THE REASONS:

TOCCO gives the wearing surfaces *superhardness* . . . for greater resistance to wear and abrasion. TOCCO preserves the previous *strength and ductility* of the core . . . for greater resistance to the stresses of high pressures and speeds.

Leading engine builders use TOCCO-hardened crankshafts and camshafts for trouble-free mileage and lower costs. Millions are now in service.

THE OHIO CRANKSHAFT CO.

Dept. DP 15. • Cleveland 1, Ohio



TOCCO

**INDUCTION
HARDENED
Crankshafts
and Camshafts**

Diesel driven generators in three engine rooms separated by water-tight bulkheads provide power for two 5000 hp. DC motors driving conventional stern propellers and a 3300 hp. DC motor driving a bow propeller. This bow propeller can operate either in the reverse direction to build up a bow wave to assist in cracking heavy ice, or in the forward direction to pull water out from under the ice allowing the ice to break under its own weight.

Another outstanding application of Diesel-electric

propulsion last year was the direct connected motor system developed for our newest submarines.

Manual of Service Tools Offered

FOR those servicing and operating General Motors Series 71 Diesels a new manual of service tools is now available. This is a 32-page booklet carrying illustrations of a complete line of specialized service tools with clear concise descriptions of the tools and their uses. The manual is offered free to DIESEL PROGRESS

readers who request it. Address requests to Kent-Moore Organization, Inc., Dept. D., General Motors Research Building, Detroit 2, Michigan.

Witte Makes Addition to Staff

WITTE Engine Works, Division of Oil Well Supply Company announces the appointment of George P. Fenn as General Sales Manager.



George P. Fenn

Mr. Fenn has been continuously engaged in all phases of the Diesel, gas and gasoline engine industry, being active with distributors, manufacturers and the United States Government in engineering, service and distribution capacities in excess of 20 years.

Believes American Diesels More Versatile Than Nazis

GERMANY, the cradle of the Diesel engine industry, may awaken to find at war's end that American industrial genius and research has wrested many phases of Diesel leadership from its grasp, according to Gordon Lefebvre, president and general manager of The Cooper Bessemer Corporation.

"We have every reason to believe that the American Diesel is now far more versatile than the pre-war cumbersome European type," Mr. Lefebvre said, "and the performance and efficiency of operation which has been attained by us, partly through wartime necessity, will undoubtedly give America Diesel leadership in many respects." Lefebvre visited Nazi Germany and other European countries in 1939 and obtained a graphic picture of Diesel development at that time.

"It was already apparent in 1939 that American plans for Diesel development were far ahead



WHEN SERVICING MICHIANA OIL FILTERS

REPLACE
THE ELEMENTS
WITH
MICHIANA
ELEMENTS

Made in capacities from 163 h.p. to 3266 h.p. Element No. SA12900 is 6 1/2" diam. by 29 1/4" high.

Michiana Oil Filters made to new Navy standards from 100 to 2000 h.p. with identical elements. Element No. SA14900N is 7 1/4" diam. by 18" high.

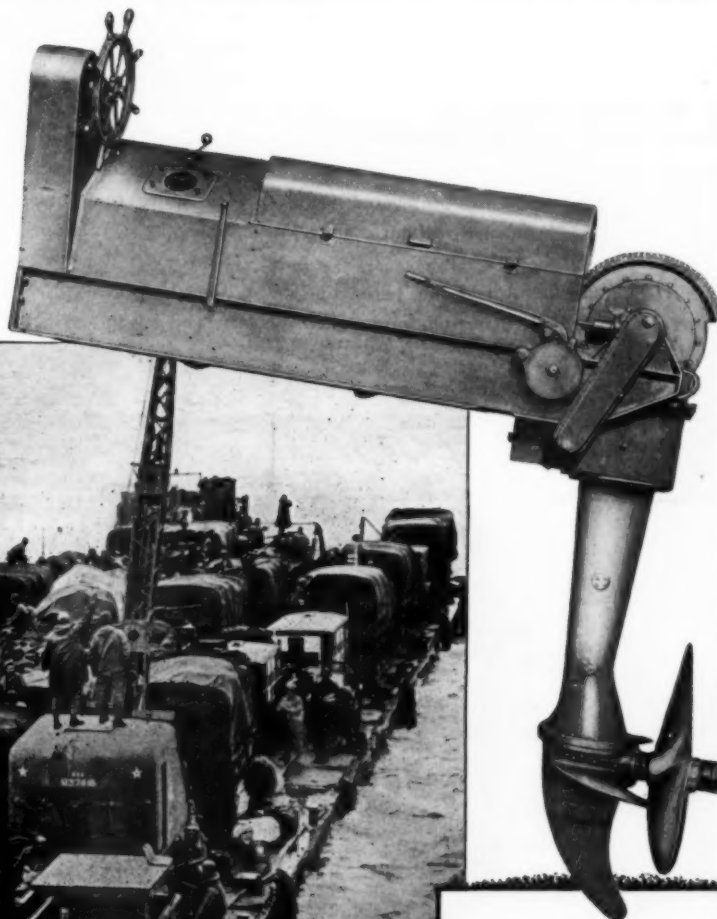
INSURE "NEW" FILTER PERFORMANCE

You can always have the maximum oil filter performance and efficiency—equal to that of a new filter—if when servicing you always use MICHIANA replacement filter elements.

MICHIANA Oil Filters are protecting millions of horsepower of engines all over the world, daily proving their high dirt-absorbing and oil-cleaning efficiency. To insure this performance, be sure when servicing that MICHIANA Elements are used. MICHIANA PRODUCTS CORPORATION, Michigan City, Indiana.

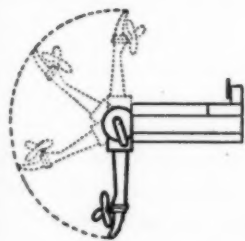
**MICHIANA
OIL FILTERS**

Objective - BEACHHEAD



- DIESEL OR GAS
- PORTABLE
- RUGGED
- FOOL-PROOF
- ONE MAN OPERATION
- 360° PROPELLER STEERING CONTROL

THAT'S THE HARBORMASTER!



The entire tail assembly may be elevated ... bringing it up out of the water to a vertical position over the unit. Damage from submerged obstacles is prevented by a shear pin which shears off, automatically allowing the outboard drive to move back and upward ... out of danger.

Built for the constant rugged work of delivering the goods from laden transports in deep water to the fighting beachheads, the Murray & Tregurtha Propelling Units again achieved their tasks when at one Norman beachhead 80% of all vehicular cargo landed, rolled from Murray & Tregurtha powered "Rhino Ferries"! It takes a man to do a

man-sized job, and on all invasion fronts "The Harbormaster" is carrying out its key herculean task!

In planning your post-war progress, plan wisely — take full advantage of "The Harbormaster's" power, extreme maneuverability, and dependability. Write today for our literature, so that you may plan the better for tomorrow!

MURRAY & TREGURTHA, INC.

High Fidelity Marine Engines since 1885

18 HANCOCK STREET, QUINCY 71, MASS., U. S. A.

MATHEWSON MACHINE WORKS — Manufacturing Affiliate

SHERBROOKE MACHINERIES, LTD., SHERBROOKE, QUEBEC — Licensed Mfr. and Distributor for Canada



of Germany's," he says, "and we had already begun to experiment toward new usages which since have been culminated."

New Blackmer Bulletin, "Facts About Rotary Pumps"

THIS is an almost complete revision of a previous bulletin of the same title numbered 304. The front cover has been used without change.

In the center spread all text has been completely revised and particular attention is called

to the drawing on page 2 which shows the portion of a bucket (swinging vane) that can wear away without affecting the capacity of a Blackmer pump and the completely new and simplified diagrams showing the operating cycle of a Blackmer pump at the top of page 3. Engineers who have seen this diagram have been quite complimentary because it shows graphically what happens inside of these pumps—always very difficult to explain.

On page 4 the new Blackmer relief valve is

shown by diagram and its operation explained graphically.

This new bulletin No. 306 came from the printer early in December and is now being distributed by Blackmer representatives.

American Locomotive Forms Export Company—Alexander M. Hamilton Named President

W. C. DICKERMAN, chairman of the board of American Locomotive Company, has announced that Alexander M. Hamilton, vice president in charge of foreign sales of the company, has been named president of a newly formed American Locomotive Export Company, Inc.

"The formation of the subsidiary," Mr. Dickerman said, "has the purpose of facilitating handling, in some countries, the substantial foreign business which we anticipate when the war has been won and world reconstruction can begin. We are not making any other moves at this time but we want to be prepared to act promptly when the time comes. A great many jobs are involved for our employees."



Alexander M. Hamilton

Mr. Hamilton was appointed vice president in charge of foreign sales of American Locomotive Company on April 1, 1944. He has served with the company, in various positions, since 1910. Between World War I and World War II Mr. Hamilton held various foreign sales positions with the company, serving as European representative with headquarters in Paris after the Armistice, until 1921. He also served as executive vice president of Montreal Locomotive Works, Ltd., Canadian subsidiary of American Locomotive Company.

A graduate of Cornell, in 1909, with the degree of Mechanical Engineer, Mr. Hamilton is a

GLOBE Spinning Power Batteries have what it takes for easy, touch-of-the-button Diesel starting. With their Perma-Set plates, Globe Spinning Power Batteries are known for their years of uniform, unfailing service. A Globe engineer will be glad to analyze your needs—without obligation. Write nearest factory.

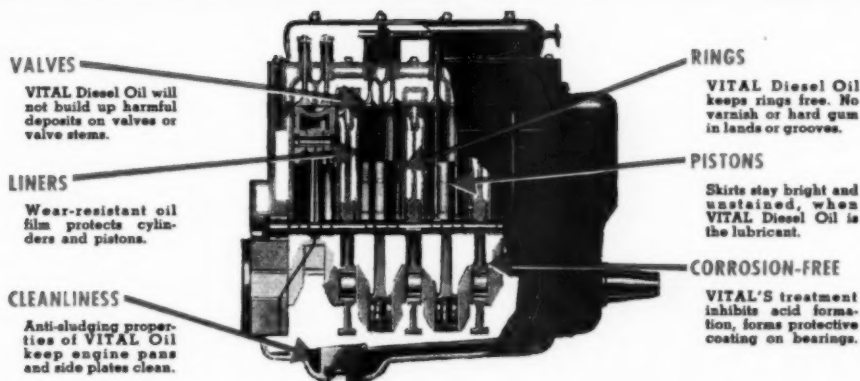
GLOBE-UNION INC., Milwaukee 1, Wisconsin

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DP. 445

Where "Vital" oil is vital !



Detergency alone is not enough

There are a number of detergent-type oils available, some good, some fair, some poor. The secret of VITAL Diesel Oils is in selection of the best available base stock, solvent-refined to purify it, then treatment of that stock with a compatible additive which further inhibits it against oxidation. As a result, VITAL Oil has these *three* merits:

D **DETERGENCY**

The ability to wash or remove gums and sludges from operating surfaces. All detergent-type oils have this property to some degree, but not all possess these other two important characteristics—oxidation stability and dispersancy.

S **STABILITY**

VITAL Diesel Oils are highly resistant to oxidation even under high heat conditions encountered in Diesel operation. The less oxidation, the fewer contaminants which the oil must

carry in solution rather than permit depositing on rings, valves or other engine parts.

D **DISPERSANCY**

This further function, allied to detergency, refers to the ability of an oil to hold contaminants in suspension, keeping them in finely divided particles and refusing to let them be redeposited on working surfaces. It is not enough to scour off the metal surfaces by detergency—the oil must also be dispersant. VITAL has both merits, plus stability.

VITAL Diesel Oil is economical, too, not only in over-all cost, but in price per gallon. Its price is well below most treated oils, is even competitive with many straight oils. Its economy, its high Viscosity Index, its low pour point, its high oiliness, its good adhesion to metals and its resistance to foaming make VITAL Diesel Oil today's best buy. E. F. HOUGHTON & CO., 303 W. Lehigh Ave., Philadelphia 33, Pa. Sales and service in all principal cities.

Houghton's **VITAL DIESEL** *Engine Oils*

member of the Export Managers Club, and was president of the club from 1931 to 1933. He toured South America in 1941 as a member of the National Research Council.

Gerotor May Acquires New Division

THE Gerotor May Corporation recently purchased the Cotner Machine Products Company, Logansport, Indiana, manufacturers of a complete line of air and hydraulic equipment for machine tools and other industrial applications.

Manager of the Logansport Division of Gerotor May Corporation is John C. Cotner, organizer of The Cotner Machine Products Company, and formerly President and General Manager of Logansport Machine Company, Logansport, Indiana. Mr. Cotner was elected a vice-president and director of the Gerotor May Corporation shortly after the transaction was completed. Rupert Esser, formerly chief engineer for Logansport Machine Company, is assistant general manager and chief engineer of Gerotor May Corporation, Logansport, Indiana. Other

key positions are occupied by: T. W. Witters, factory manager; Don Thomas, sales and engineering; Jack Marsh, sales; T. D. Witters, chief inspector; Robert Early, foreman. These men as a group represent 75 years' experience in the air and hydraulic equipment industry. All were formerly connected with the Logansport Machine Company. Plans for increased factory facilities at Logansport have been completed and are already in the building stage.

American Equipment with Russians Close To Berlin

EVIDENCE of Russia's ramming Army continuing to advance "On to Berlin" is seen in the accompanying radio photo. Newspaper headlines and hundreds of column inches of type tell us of the progress of the Red Army—how the artillery is the "Big Gun" behind the drive. This photo, one of few coming from the Eastern front, shows that industrial America is also playing an important part in that great drive. For the crawler tractors pulling the guns ever closer to Berlin are American made . . . manufactured by Allis-Chalmers Manufacturing Company, and powered by General Motors 3 cycle Diesel engines, the HD-7 series shown is the smallest of three Diesel tractors made by Allis-Chalmers.

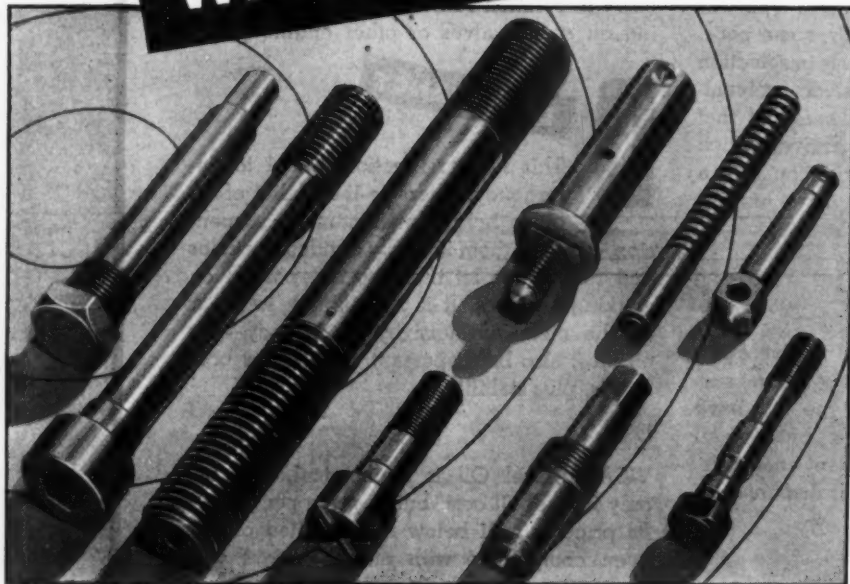


Hard hitting Soviet artillery, pulled by American made Allis-Chalmers crawler tractors, powered with General Motors Diesels, advance through deserted Unilubelska Square, Warsaw . . . the monumental city of liberated Europe. Photograph by A. Kapustyansky—Radiofoto by Soufot Service.

4-Star "E" Flag to American Machine and Metals

A NEW four-star Army-Navy "E" flag was recently awarded to American Machine and Metals, Inc. in recognition of more than three years of sustained high production of war implements. Its first flag was won by the company in the autumn of 1942. During its more than three years of total production of war equipment, the East Moline plant, in addition to gun mounts, has produced light 2½ ton crawler-type airborne bulldozer tractors for the Corps of Engineers. Its Troy Laundry Machinery Division was the Army's largest supplier of ten-ton trailer-mounted mobile field laundries. Its DeBothezat Fans Division is the originator and

**YOU DESIGN 'EM
WE'LL MAKE 'EM**



Versatile, exacting, efficient—yes, we admit that we are all of these and more . . . In developing a source of supply for screw machine products, you can counsel in confidence with The Chicago Screw Company.

For almost three-quarters of a century we have excelled in producing precision-made screw machine products. The "Know How" accumulated over these long years of experience has resulted in an organization that is exceptionally well qualified to help you with your present problems and post-war developments.



If your requirements run into hundreds or millions of pieces, regardless of size, shape or material—you design 'em, we'll make 'em.



THE CHICAGO SCREW CO.

ESTABLISHED 1872

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L PROGRESS

manufacturer of a novel type of steel engine cooling fan for military vehicles, which include medium tanks, tank destroyers, amphibious combat units and small landing craft. These engines are literally buried within armored compartments of the vehicles, presenting one of the most difficult of all engine cooling problems.

The new four-star Army-Navy "E" flag is to be retained by the company for a full year instead of the usual six months' period, in view of American Machine and Metals' consistently excellent production record. The company's subsidiary, U. S. Gauge Company, also flies the "E" flag won by it last summer.

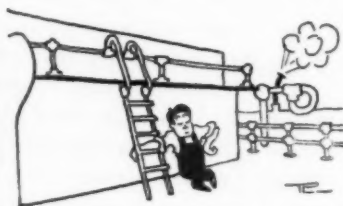
Duke Golden Named Perfect Circle Educational Director

DUKE GOLDEN, formerly associated with the Engineering Division of the Perfect Circle Company, Hagerstown, Indiana, has been transferred to the Sales Division, according to Don H. Teetor, Vice President in Charge of Sales.



Duke Golden

As Educational Director of the Sales Division, Mr. Golden will act in the capacity of liaison man between Perfect Circle's Engineering and Sales Divisions. Mr. Golden will be responsible for the training of Perfect Circle salesmen, and the development of engineering information for distribution and publication. He will also write and assist in the production of films.



WESTON'S ALL-METAL TEMPERATURE PRINCIPLE ASSURES DEPENDABLE READINGS, OVER LONGER PERIODS!

The long-term dependability of the WESTON thermometer stems from its rugged, all-metal construction. It consists of only a simple, durable all-metal temperature element safely encased in a stainless steel stem. No gases or liquids, no capillary, no complicated mechanical linkages, no fragile parts are employed. Because of this extreme simplicity, and the absence of so many common trouble points, WESTONS maintain their high initial accuracy over far longer periods. Thus they provide better protection for processes and equipment, and keep replacement and maintenance costs at a far lower level.

Literature describing these dependable and rugged thermometers, including types, stem lengths, prices, etc., gladly sent on request. Weston Electrical Instrument Corporation, 579 Frelinghuysen Avenue, Newark 5, New Jersey.



WESTON All-Metal Temperature Gauges

are available in sizes and types for most industrial needs . . . as well as in laboratory models with full scale accuracy within 1/2 of 1%.

WESTON

All Metal
TEMPERATURE GAUGES

Petroleum Solvents Makes New Research Arrangement

STANFORD L. HERMANN, operating vice president of the Apex Chemical Co., Inc., recently approved the signing of an agreement with Louis A. Staff, president of Petroleum Solvents Corporation wherein the Apex Chemical Co., Inc. will supervise, direct, and promulgate the entire research of the Petroleum Solvents Corporation for the year of 1945.

To undertake this work Dr. Harry Kaplan, a

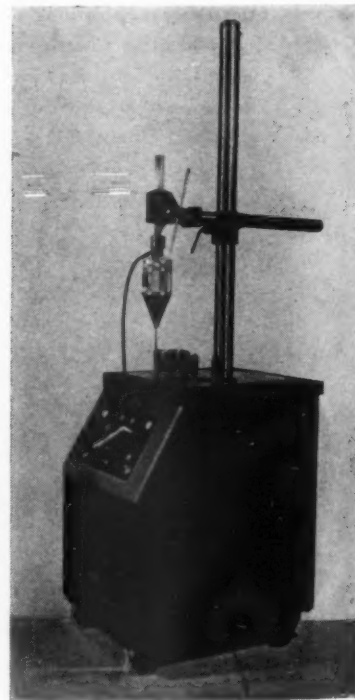
graduate of New York University, where he took his preliminary and doctorate degrees, has been engaged. Previously, Dr. Kaplan was employed at the Winthrop Chemical Co. where his work has been principally in the production of organo-medicinals, quaternary ammonium compounds, and other essential industrial developments.

The work which Dr. Kaplan will do under the supervision of Sidney M. Weinstein, director of Research of Apex Chemical Co., Inc., will be

of timely and prime importance as the majority of the contracts which Petroleum Solvents Corporation hold are contingent upon the operation of motor vehicles whose essentiality to the war effort can not be over-exaggerated.

Thomas Tap Extractors and Metal Disintegrator Machines

ONE of the sensations of the recent Cleveland Metals Congress and New York Power Show was the Thomas Tap Extractor and Metal Disintegrator machines. They were developed late in '43, as a war necessity, to speed production of critical machined parts, by taking them out of salvage and putting them back into production. Consists, basically, of a coolant system, graduated stepdown transformer, working head—holding modified solenoid coils—and actuating a plunger carrying a hollow, non-ferrous electrode.



Thomas Tap Extractor and Metal Disintegrator

To remove a broken small tool (Tap) from a critical work piece, an electrode of proper diameter is screwed into the plunger of the working head, and the broken embedded tap centered under the electrode. Work piece is held to table with a "C" clamp, or other holding device, and electrode is fed down to make contact with broken tap. Coolant and a low-voltage, high amp. current flow through the electrically-vibrated electrode, creating a high temperature make-and-break arc at point of contact. Rapid, controlled integration of contacted metal progresses through core and bottom of tap, after which cutting edges, which were left in place

Wherever there is internal combustion there are bound to be petroleum residues, known as gum and sludge, which immediately cut down on the power of the engine and eventually destroy it.

LOOSITE and SILOO are solvents of these residues. LOOSITE cleans out the engine, then SILOO added to fresh crankcase oil keeps it clean. Thus your engine is freed of gum and sludge quickly, safely, economically while it is in operation.

LOOSITE and SILOO have been helping to better engine performance for nearly fifteen years. They are equally efficient on all types of Diesel and Gas engines. Get in touch with Petroleum Solvents Corp. today. You will be astonished to learn how we can help you increase the life and efficiency of your engines.

Petroleum Solvents Corporation

331 MADISON AVENUE, NEW YORK 17, N. Y.

P. S. If you heat with oil—write for information on SILOO FUEL OIL TANK SOLVENT

protect thread and side walls of hole, can easily be lifted out with magnetized scriber, leaving hole, thread and workpiece good as new. Because of approximate $\frac{3}{8}$ " travel of plunger, feed is semi-automatic. High temperature of arc has been confined almost entirely to tip of electrode, so work piece is never heated to point of annealing, and no warping, distorting, or change of Rockwell takes place. For all particulars, write Clinton Machine Company, Sales Office, 8240 Harper, Detroit 13, Michigan.

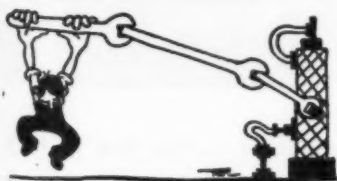
Bobrick Joins Staff of Bardco

BRINGING with him a background of more than ten years' experience in the sale and installation of marine Diesel engines, Nicholas B. Bobrick has joined the staff of the Bardco Manufacturing & Sales Company, according to Fred Jervis, president of Bardco. Bobrick will specialize in the marine equipment produced by Bardco, since he has been active for many years among commercial and pleasure boat operators along the Pacific Coast.



Nicholas B. Bobrick

Prior to joining Bardco, Bobrick was manager of the marine engine division of the Johnson Specialty Company, Wilmington, Cal., distributors for Murphy Diesel engines. Former experience included sales and service assignments for west coast representatives of Atlas-Imperial, Cummins, Cooper-Bessemer and Western. Until recently, Bobrick was engaged for a considerable time in the assembly and supplying of all auxiliary generating units installed in the concrete oil barges built by the Concrete Ship Constructors, of National City, California.



Four Time Winner— Army - Navy - Honor

FOR the fourth time the Sterling Engine Co. has raised a new Army-Navy "E" flag over its plant, this time with the third star affixed, signaling a continuance of high production standards for war. Announcement of this latest honor was made in a congratulatory letter by Admiral C. C. Block, U. S. N. (Ret.) to Addison F. Vars, President of the Sterling Company. The first award was made in April 1943 and has been repeated at regular intervals.

Among the Sterling engines that power many types of craft for the Army, Navy, Coast Guard and Allied Nations are Sterling Admirals, Vikings and Petrels in power range from 85 hp. to 1800 hp. The Sterling Company has been building engines for nearly half a century for both marine and stationary power applications. Out of these years of experience, just recently announced, has come the new Viking Diesel engines, six and eight cylinders, supercharged and unsupercharged to meet the horsepower requirements of a wide range of power needs.

AN OPEN LETTER

To a Plant Owner or Manager:

Dear Sir:

When you TRIM FOR POST-WAR COMPETITION, fractions of pennies of cost per unit of product may be vitally important—may, in fact represent your profit.

Power cost is a good place to start checking. It's something YOU can control.

You may think that your present cost is O.K., but if your plant requires constant and substantial power—you COULD be wrong.

Buckeye Diesels have cut the power costs of many plants. We would like to show you how and why.

Will you write us? NOW is the time to plan. Plants using old, wasteful power equipment may obtain priorities and install new equipment NOW.

Very truly yours,

THE BUCKEYE MACHINE CO.

\$5⁰⁰

DIESEL ENGINE CATALOG

VOLUME NINE

*described . . .
properly illustrate*

VOLUME 9

ORDER YOUR COPY **NOW**

DIESEL ENGINES, INC. — Two West Forty-Fifth Street — New York 19, N. Y.

Enter my order today for a copy of the New Diesel Engine Catalog, Volume Nine, Edited by Rex W. Wadman, for which I enclose \$5.00.

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PLEASE PRINT NAME AND ADDRESS

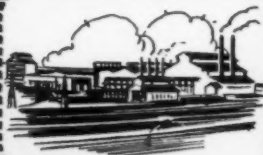
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by
ERIE

**SHIPS FOR
VICTORY**

Forgings . . .

• By the Erie Forge Company, finished for Diesel Crankshafts, Line Shafts and other forged parts, are driving the Nation's Ships for Victory . . . Forgings and Steel Castings are produced at Erie Forge Company under One Responsibility and with One Control . . . You can depend upon the Quality and Service which this complete control, from raw material to finished product, accords your requirements when you place them with us.



ERIE FORGE COMPANY, ERIE, PA.





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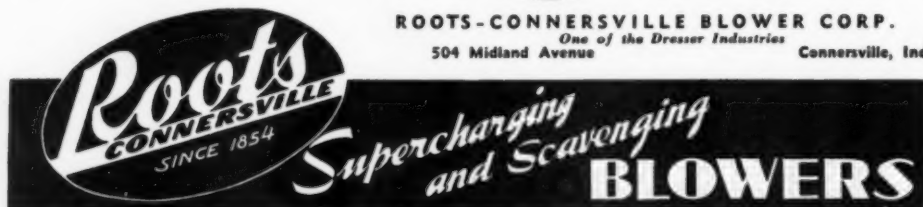
Capacity of each "R-C" Scavenging Blower in above installation exceeds 13,000 CFM. Speed 800 RPM; pressure 23 1/2 lbs.



at all
operating
speeds

Having a sustained high efficiency over the same speed range as Diesels, Roots-Connorsville Rotary Positive Displacement Blowers are particularly suited for direct connection to these engines. Couple this with the positive pressure build-up, characteristic of "R-C" Blowers, and you have the two main reasons for their outstanding success in supercharging and scavenging applications. Your inquiries are invited regarding supercharging and scavenging problems.

ROOTS-CONNORSVILLE BLOWER CORP.
One of the Dresser Industries
504 Midland Avenue Connorsville, Ind.



The Heat Exchanger is Only Part of a Safe Engine Cooling System—

Sims has a wide experience gained in applying heat exchangers in the cooling systems of hundreds of internal combustion engines. Your Diesel Jacket Water Cooling problem may have been worked out many times at Sims—the answer is in our files. Sims has worked with most leading Diesel builders and with users in all parts of the U.S.A. Over 60 years of Sims Heat Recovery experience can help you apply a Sims Heat Exchanger to your Diesel. Give us your problem.

Write for booklet "Heat Recovery No. 2."



Cooper Bessemer Appoints Myers to Capitol Staff

APPOINTMENT of Walter F. Myers to the staff of the Washington office of The Cooper Bessemer Corporation is announced by Stanley E. Johnson, General Sales Manager.



Walter F. Myers

Mr. Myers brings to the company a broad experience in the equipment and Diesel field, having served during the past 25 years as sales engineer, construction engineer and consulting engineer for public and private corporations, including the Fairbanks Morse Company, the Federal Power Commission and the United States Maritime Commission. Mr. Myers will assist Charles G. Cooper, director of the Cooper Bessemer Washington office in the handling and supervision of government contracts and sales and service in the Southern Atlantic States.

T. W. Pettus Appointed President of National Bearings Division

DIRECTORS of American Brake Shoe Company have appointed T. W. Pettus President of National Bearing Division, William B. Given, Jr., President of Brake Shoe, announced today.

Mr. Pettus has been Executive Vice President of the National Bearing Metals Corporation, until recently a subsidiary of the parent company. On December 6, 1944, the National Bearing Metals Corporation was merged with Brake Shoe and became a full fledged division. Incorporated May 4, 1927, NBM resulted from a merger of several non-ferrous foundries and at present has seven plants located in Chicago, Jersey City, Meadville, Pa., Pittsburgh, Pa., Portsmouth, Va., St. Louis, Mo., and St. Paul, Minn.

Name Savacool to Mack Board

APPOINTMENT of J. E. Savacool, vice president and comptroller, as a member of the board of directors of Mack Trucks, Inc. has been announced by L. G. Bissell, board chairman. Mr. Savacool joined Mack in 1913 as an accountant in the Chicago Branch.



J. E. Savacool

Following his work in Chicago he went to Mack's San Francisco branch as manager of the office. He then was appointed to the home office in New York where he has remained with the exception of a short time in the Los Angeles Branch. Mr. Savacool was elected vice president and comptroller in January of 1925 and will continue to hold those offices. He also will continue as a director of Mack Manufacturing Corp.

New "Quill"-Type Generator

WHERE compactness is required, there is a new "quill" type generator, the armature of which mounts directly onto the shaft extension of the engine and the frame is bolted directly to the engine crankcase. Developed and manufactured by Kurz & Root Company, Appleton, Wisconsin, this new generator is made in AC and DC, 1800, 2600 and 3600 rpm., in ratings of 850, 1000, 1500, 2000 and 3000 watts. This type of mounting reduces the overall length and weight of the entire unit, and also eliminates the use of bearings in the generator.

DEMA Issues Bulletin On Opportunity In the Diesel Industry

AFTER conducting nine educational conferences in various parts of the country and discussing Diesel engineering with 116 deans and professors, D.E.M.A. boiled down what we found into a 4-page folder, copies of which will be mailed on request to Diesel Engine Manufacturers Association, 1 North La Salle Street, Chicago, Ill.

It all starts with Bendix



The Drive for Heavy-Duty Starting

Heavy-duty industrial machinery demands quick, dependable starting—and Bendix Heavy-Duty Starter Drives provide just that.

Specifically designed for the task at hand—engineered to operate satisfactorily even under adverse working and weather conditions—Bendix Heavy-Duty Starter Drives are performance-proven in starting all types of industrial machinery.

In the forests—on the farms—in the oil fields and in the factories—in fact, wherever heavy-duty starting demands *the best*—it's Bendix! Over sixty-five million installations of Bendix Starter Drives to date—many more *tomorrow*. Better buy Bendix!

BENDIX AND ECLIPSE ARE TRADE-MARKS OF BENDIX AVIATION CORPORATION



Bendix Drive
ECLIPSE MACHINE DIVISION

BENDIX AVIATION CORPORATION, ELMIRA, NEW YORK

TOOLING FOR SPEED AND ACCURACY

★ For fourteen years tool making has been our business—and always will be. Our engineering department is ready to discuss your present or future problems—our tool making shop—one of the best equipped in the world—will build any size tool weighing from a few ounces to tons. Write for our brochure "Men and Machines."

A.W. HECKER

ENGINEERS and Tool Makers

Established 1931

1975 E. 66th STREET, CLEVELAND, OHIO • OFFICES IN PRINCIPAL CITIES

TO COMPANY PRESIDENTS:-----



Here's Another
BIG CHANCE FOR YOU
to "Pass the Ammunition!"

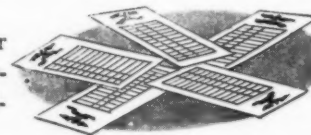
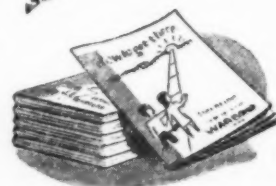
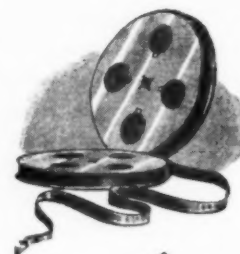
Today—thanks largely to you and other industrial executives—22,000,000 civilian workers are speeding victory and achieving postwar security through the Payroll Savings Plan. Over 60% of the 6th War Loan subscriptions came from this source—and, between drives, this forward-looking plan has been responsible for 3 out of 4 War Bond sales!

Good as this record is, the Payroll Savings Plan can be still more effective. Believing this can best be accomplished by giving Bond buyers a definite idea of the many benefits accruing to them, the War Finance Division has prepared a variety of active aids for employee education.

This new "ammunition" includes:

- a—An entertaining, swift-paced moving picture, graphically showing the importance of buying—and holding—War Bonds.
- b—An interesting, easy-to-read booklet, explaining how War Bonds may be accumulated to provide education for children, homes, retirement incomes, etc.
- c—Attractive, handy War Bond envelopes, enabling Bond holders to note each separate purchase—and the specific purpose for which each Bond or group of Bonds was bought.

Passing this particular ammunition requires that you reappraise your own company's Payroll Savings Plan. Have your own War Bond Chairman contact the local War Finance Committee—today! They will welcome the chance to discuss this new program with you.



The Treasury Department acknowledges with appreciation the publication of this message by

R. W. Tamm

Editor—DIESEL PROGRESS

This is an official U. S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council

Arthur R.
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APRIL 1945

Arthur R. C. Markl Appointed Chief Research Engineer

D. MATTIMORE, director of research and development for Tube Turns, Louisville, Ky., announces the appointment of Arthur R. C. Markl to the post of chief research engineer. Before joining Tube Turns, Mr. Markl was for fourteen years associated with the M. W. Kellogg Company, New York, last in charge of the development of equipment for oil refineries. He is a graduate of the Technical Institute of Munich and a member of the American Society of Civil Engineers.



Arthur R. C. Markl

Tube Turns manufactures seamless welding elbows and related welding fittings for the piping systems of a wide range of industries, among them: petroleum, chemical, shipbuilding, heating and refrigeration, chemical and processing. The firm also manufactures flanges and is a large-scale producer of aluminum steel forgings.

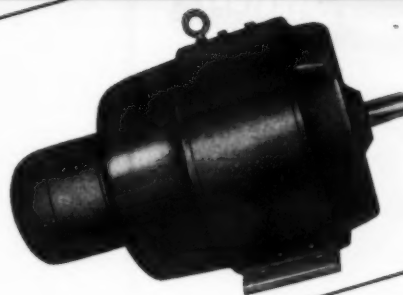
Maritime Commission Orders More "Baby Tankers"

THE Navy's new "baby tankers" (BT-1 type) are hailed by many in maritime circles as highly indicative of the modern trend in tanker propulsion power. U. S. Maritime Commission has awarded contracts to the Saint Johns River Shipbuilding Company of Jacksonville, Florida, for the construction of twelve more BT-1 tankers with Enterprise Turbocharged Diesel Engines specified for propulsion power. Designed by Joslyn & Ryan, well-known San Francisco naval architects, these new tankers are of the same type that has already proved so dependable in world-wide service.

320 feet in length, with cargo capacities of 30,000 barrels, these tankers require high propulsion power in limited space, plus extra reserve power for use in emergencies.

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ESPECIALLY recommended for isolated light and power plant, the Kurz and Root two bearing AC generator is designed for direct connection to gasoline and Diesel engines. As illustrated above, excitation is provided by direct connected exciter. Units are supplied in capacities of 12.5 KVA up, and in single phase 2 and 3 wire; three phase 3 and 4 wire; 50 and 60 cycle. Write for complete engineering data.

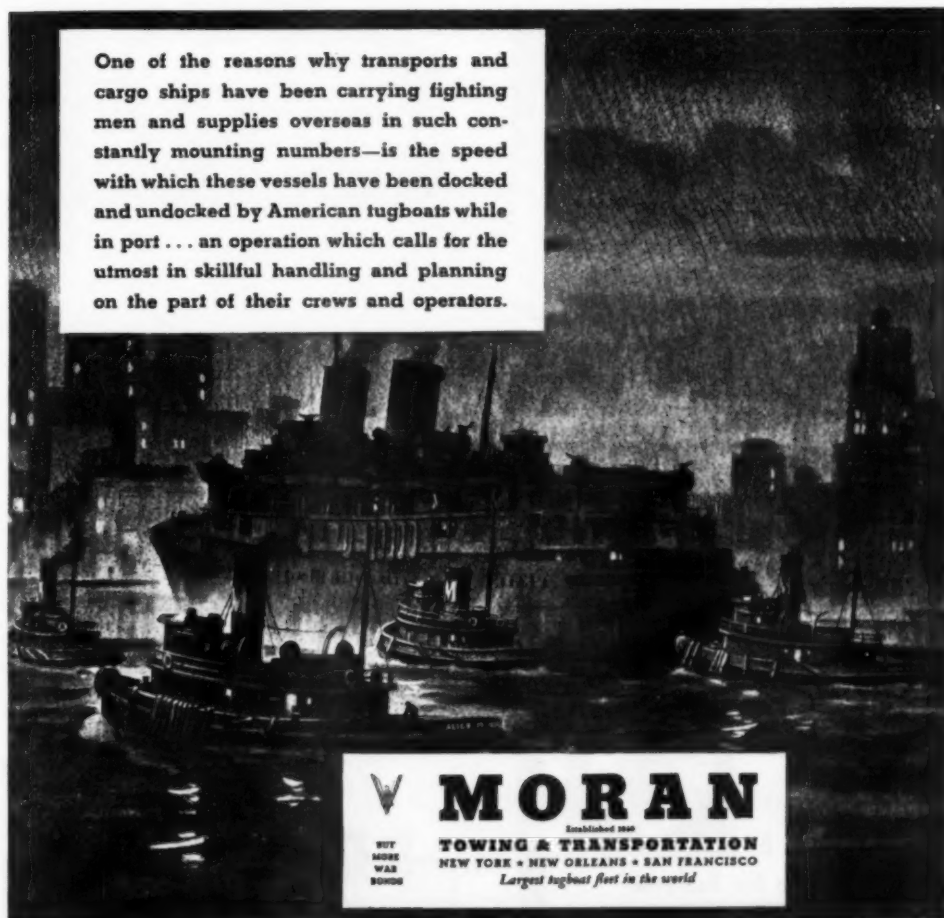


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To fully utilize the entire output of 1400 hp. delivered by the Enterprise Diesels, the engines will be direct-connected to a Westinghouse reduction gear turning the propellers at 165 rpm. Direct connecting of the engine to the gear saves eight feet of length.

R. E. Fritsch Elected Tube Turns President

R. E. FRITSCH, vice president of Tube Turns, Louisville, Ky., since 1929, has been elected president, succeeding Walter H. Girdler, Sr., who died on January 7. He joined Mr. Girdler when Tube Turns was originally organized and he has had a major part in the firm's rapid growth.



R. E. Fritsch

Mr. Fritsch continues as vice president and a member of the board of directors of The

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1944 DIESEL PROGRESS Editorial Index

A COMPLETE index of all editorial material which appeared in the 1944 issues of DIESEL PROGRESS is now available. Included is a cross index of authors and articles. Feature articles are covered by title; news notes are indexed by names of manufacturers. No charge for this index. Address requests to DIESEL PROGRESS, 2 West 45th Street, New York 19, N. Y.

Y. Y.

PROGRESS

Girdler Corporation, of which Tube Turns is an affiliate. He is a member of the American Society for Metals and the American Welding Society.

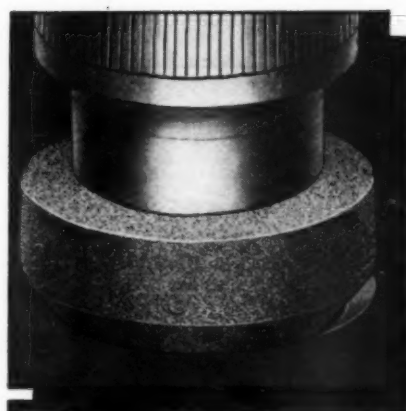
Middlekamp Joins Mack

APPOINTMENT of John H. Middlekamp, recently resigned director of the Automotive Division of the War Production Board, as manager of the Government Department of Mack Trucks, Inc. has been announced by C. T. Ruhf, president.



John H. Middlekamp

Mr. Middlekamp was director of the automotive division of WPB from Jan. 1, 1944 until his resignation Jan. 6 of this year. Prior to that he had spent a year and a half as a lieutenant colonel with the Army handling its truck production problems, resigning to join WPB. He had been superintendent in charge of the surface lines equipment for the Brooklyn-Manhattan Transit Corp. for many years, and was brought into government service as a transportation expert in the Office of Production Management when that organization started to function immediately after the United States entered the war. Mr. Middlekamp will continue as a consultant to WPB and will retain his chairmanship of the Truck Committee of the Combined Production Resources Board. He will make his headquarters in Mack's executive offices.



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Left: Close-up of patented HALL Eccentric or Point Contact Grinding Principle

HALL Service type Diesel Valve Seat Grinders are identical in principle and performance with large HALL Multiple Spindle Seat Grinders as used by leading manufacturers to insure finest precision and finish in their engine production; to provide finer performance longer.

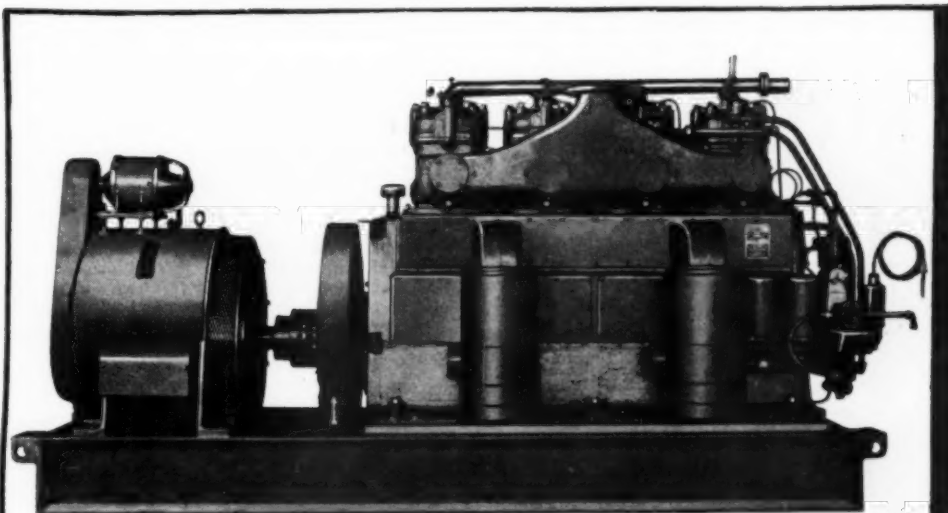
With the HALL Model EDP Seat Grinder shown above any mechanic can quickly service diesel valve seats to factory standards of precision and finish. Thousands of marine, locomotive, automotive and stationary diesels require servicing less often because of HALL ground valve seats.

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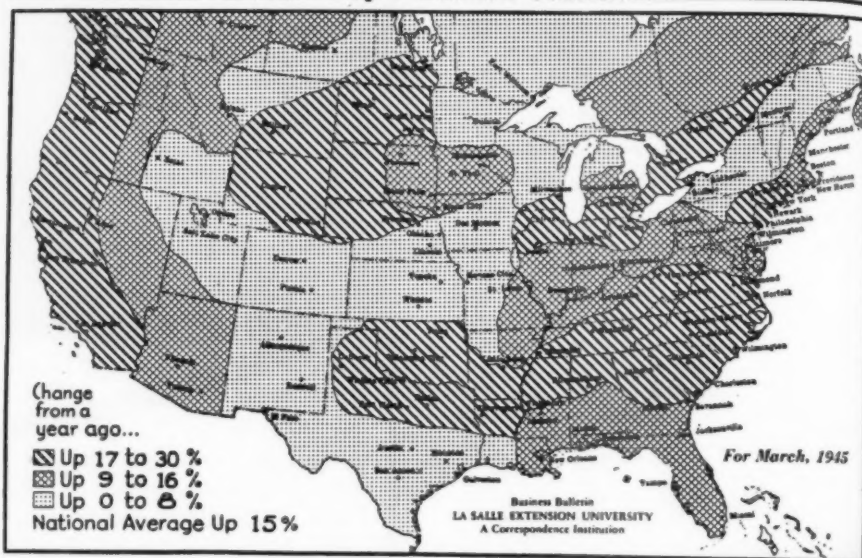
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 LUBRICATOR DIVISION

LaSalle Map of Business Conditions



Volume of Trade and Industry Is 15 Per Cent Higher Than Last Year

Map Supplied by BUSINESS BULLETIN DIVISION of La Salle

The trend in trade continues upward and more than offsets the slight decline in industrial activity. The result is that total business volume, which includes both production and commercial transactions, remains high. It is about 15 per cent higher than it was a year ago and in some parts of the country the increase is even greater. Present indications point toward some further expansion for the next few months, although the rise is not likely to be as rapid nor as extensive as it has been.

The variations among different sections of the country are similar to those which were significant during the last part of 1944. The major changes were in the East and Northeast where severe winter weather and heavy snow storms disrupted transportation for several weeks. Business in all lines was adversely affected and in several places activity dropped below the level of a year ago. The recession is expected to be only temporary, however, and already some signs of more-than-usual spring expansion have been evident.

The area around New York city continues to show the most marked improvement, due largely to the enormous foreign shipments which are passing through that port. Some falling off would take place if the European War should end soon, but even after the fighting stops large quantities of goods will be shipped abroad for many months. Activity in other coast cities has held up well, but not quite so far above last year as it has in New York.

In the industrial region around the Great Lakes, the sharp upward spurt of several weeks ago has slowed down and in many places activity is but little higher than it was last year. The Chicago and the Detroit areas are now making the best showing and

the large new war contracts in each city will keep factory operations at high levels for some time. The steel industry has been turning out a little less steel than it did a year ago.

Business volume throughout the South shows little change from that of recent months. In most sections the level of activity is not far from the national average, with the industrial areas just a little higher than in the more exclusively agricultural districts. Business is slightly below the unusually high levels of last year in several places. The relatively less favorable trend in lower Texas is due more to that comparison than it is to any extensive decline now.

The Pacific Coast region continues to report business that is better than the national average as it has been doing for several years. Shipbuilding and airplane manufacturing are the most important industries in which activity keeps on at a high rate. The increases have been somewhat greater in the southern part of California than they have been in the northern coast states but everywhere business is above last year.

In Canada, the increase in the volume of business has been a trifle greater than in the United States, but the variations among the different sections have been about the same. The best areas are in the industrial region north of the Great Lakes and along the Pacific Coast. The differences between these sections and the other parts of the country are not great, however, and the general trend is gradually upward. Agricultural conditions, especially in the Prairie Provinces, have improved considerably and farm income is higher than it has been for several years. The large demand for agricultural and industrial products will keep activity at a high level for at least several months and perhaps longer.



Application for Membership in the
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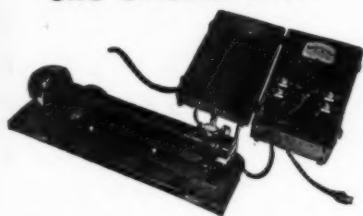
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Braendel Named Chief Engineer

THE appointment of Helmuth G. Braendel as chief engineer of Wilkening Manufacturing Co., producer of Pedrick piston rings at Philadelphia, Pa., has been announced by F. W. Wilkening, president.



Helmuth G. Braendel

For the past three years Mr. Braendel has been assistant and then chief development engineer for Continental Motors Corp., Detroit. Prior to that for seven years he was project engineer in the Engine Development Div. of Chrysler Corp. He is a graduate of Stevens Institute of

Engineering, with degree of Master in Mechanical Engineering. Under an International Exchange Fellowship, Mr. Braendel studied advanced Mechanical Engineering and Aeronautical Engineering in European Universities.

He brings to his new responsibilities at Wilkening, therefore, not only an extensive technical schooling but a 10-year background of intensive experience in designing, developing and testing internal-combustion engines which included specialized piston-ring work. Mr. Braendel is a member of the Society of Automotive Engineers.



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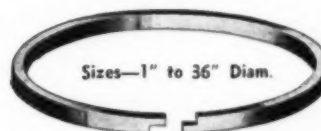
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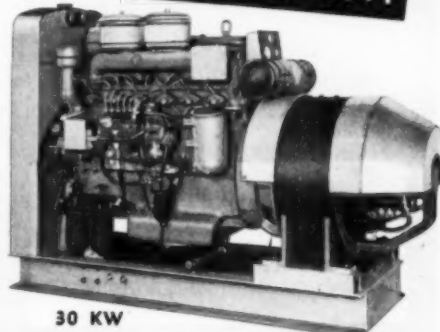
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New York

WEST COAST DIESEL NEWS

By JIM MEDFORD

PREFABRICATED, the new 131 ft. tuna clipper nearing completion at United Concrete Pipe Co., Long Beach, California, will be all Fairbanks-Morse equipped—800 hp. main engine, auxiliaries, pumps, etc., with Burgess snubber, Honan-Crane lube filters and Air Maze intake air silencer, cleaner.

A 400 hp. Enterprise Diesel is going into Dragich Brothers' new 87 ft. seiner by Harbor Boat Building Co., Terminal Island, California.

ANOTHER Mack marine Diesel goes into an Alaska halibut vessel—the 46 footer by Ed Monk, N. A., for Tom Rustad of Petersburg. Engine is 100 hp.

THE Buckeye Machine Co., Lima, Ohio, has appointed two new Pacific Coast distributors, Crofton Diesel Engine Co., San Diego, California, and Marine Engine and Machinery Co., Tacoma, Washington.

ANDERSON and Christofani yard is building ten water taxis of 64 ft. for bay-point service to industrial plants by the Navy to be powered with 300 hp. Union Diesels.

THE San Francisco Bay tug *Jim Wilder No. 2* of the Wilder towing fleet has been re-powered by Bruir and Siemer, Hunter's Point, California, with a pair of 115 hp. Caterpillar marine Diesels with Whitney chain and Twin Disc gear trains.

THE fourth of a series of fish boats under construction at Gardiner, Oregon, by the Fred Schulte yard is a 66-footer with 135 hp. Caterpillar marine Diesel and Twin Disc gears and Lambie wheel.

TWO new Atlas Imperial marine Diesels are being installed at Salmon Bay, B. C. in the *Republic* and *Junior*. Of 155 hp., the Fishing Vessels Owners' Association are installers.

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**DRAFTSMEN — DETAILERS —
LAYOUT MEN**

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Top flight manufacturer of quality engines offers real opportunity to several draftsmen who have a lot on the ball and eyes on the future. Medium-sized organization that's climbing fast. Good living conditions and adequate salary. Tell us all about yourself in strict confidence. Write Box 148, DIESEL PROGRESS, 2 W. 45th St., New York 19, N. Y.

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PRECISION BEARING

**FOR EVERY LOAD,
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108 DISTINCT SERIES
OVER 3000 SIZES
BALL, ROLLER and THRUST

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The Modern GAS TURBINE

By **R. TOM SAWYER, M.E., E.E.,
Engineer, Diesel equipment, American Locomotive Company; Chairman, Co-ordinating Committee on Gas Turbines of A.S.M.E.**

**Its Uses as an Exhaust Turbo-
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All Fields of Service,
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Just published, this new work brings together in one compact volume a great wealth of authoritative information on the gas turbine. It traces the history of this power device from its earliest inception down to its latest applications in all fields of service on land, on sea, and in the air. Briefly, here are some of the principal topics covered in the 10 chapters:

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- how turbocharging increases engine power
- efficiency of the internal combustion turbine and factors in performance; mechanical aspects
- use of gas turbines in industry, diesel electric locomotive, marine service
- use of turbosuperchargers in the aircraft engine
- operation of the jet propelled plane

PROFUSELY ILLUSTRATED! Author has included 131 line drawings, halftones, blueprints of various types of gas turbines, charts, graphs, and tables.
216 Pages 6 x 9 Inches \$4.00

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U. S. Products Co.
518 Melwood St. Pittsburgh, Pa.

IT'S another Atlas marine Diesel at the Everett Marine Ways for Williams and Graham, an 85 hp. engine with Fairbanks-Morse pumps and Coolidge wheel.

THERE will be a new Lorimer marine Diesel in the 60 ft. otter trawler *Suntower* by Madden & Lewis, Sausalito, California, for Guido Pao- lini; engine is of 150 hp. and the second for Guido.

IN the Newcastle Shipbuilding Co.'s yard at Nanaimo, B. C., several 114 ft. vessels will be built for the Canadian Army Transport Corps. Power is a pair of 200 hp. Cummins Diesels.

UP in Seattle, Washington, the Atlas Engine Co., distributors, reports sale of a 100 hp. Mack "Mariner" Diesel with Twin Disc gears to Dick Nicholson for the 45 ft. dragger *Emma H.*

ANOTHER Seattle, Washington, construction job includes Cummins Diesels for two craft: a 175 hp. each in the 70 ft. *Marvel* and the 74 ft. unnamed new dragger building by Kirk- land.

THE *City of San Pedro* by Harbor Boat Co., Terminal Island, California, has a 400 hp., 6 cylinder Union Diesel for propulsion and a Caterpillar auxiliary.

A SUPERCHARGED Union Diesel, 540 hp., propels the *Liberty Bell* by Campbell, San Diego, California. Caterpillar Diesel generating sets supply A. C. current; Fairbanks-Morse motors and pumps are included.

THE *Ruby VIII* tug, by Reliable Welding Works, Olympia, Washington, for General Con- struction has dual General Motors 165 hp. Diesels with Twin Disc gears, Gibson roller chain drive to single shaft, a reduction of 6 to 1 for 10.6 knots.

PANISH CONTROL MEANS FOOLPROOF CONTROL



Finger Tip REMOTE CONTROL

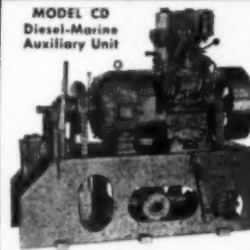
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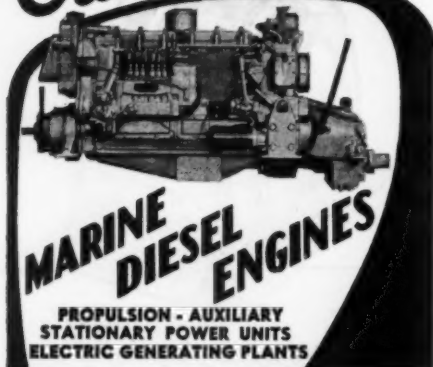
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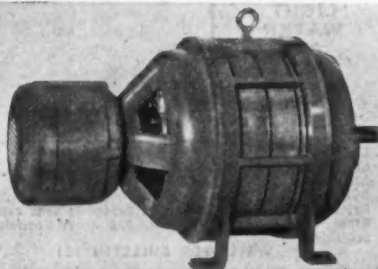
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